HOMES: A household model for economic and social studies

Andrew Mason

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HOMES: A household model for economic and social studies

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CONTENTS

Preface *ix*

Abstract *1*

1 An overview of HOMES *1*
  General application *1*
  Application of HOMES to the Republic of Korea *3*

2 Description of the model *9*
  Projecting the number and type of households *9*
  Projecting trends in headship rates *15*
  Projecting household membership *18*

3 Technical description of the model *36*
  Conventions *36*
  Definition of variables *36*
  Calculating the number of households *37*
  Calculating the number of children of a household head *38*
  Calculating the number of grandchildren of a household head *39*
  Calculating the number of parents of a household head *40*
  Calculating the number of other household members *41*
  Calculating offspring weights *41*
  Adjusting offspring weights *43*
  Reliability of procedures *43*

4 Running HOMES *44*
  Data input for stage 1: Rate calculations *44*
  Data input for stage 2: Household projections *49*

5 Description of output *50*

Appendix A. Headship rates, by household type and age of head: Six Asian countries, 1970–80 *101*

Appendix B. Summaries of HOMES programs *107*

Bibliography *113*

FIGURES AND EXHIBITS

Figures

1. Headship rates for men and women, by age group: Thailand, Taiwan, the Philippines, and Malaysia, recent years *11*
2. Relationship of marriage to intact household headship among men in Thailand, Republic of Korea, the Philippines, and Malaysia, recent years *12*
3. Headship rates for single-headed and one-person households, by age and sex of the household head: Republic of Korea, 1980 *14*
4. Actual and projected sex ratio trends: Indonesia, Thailand, and Republic of Korea, 1960–2000 *18*
5. Actual and projected ratios of offspring under age 15 to adults, by age of mother: Japan, Republic of Korea, Thailand, and Indonesia *25*
6. Likelihood of a child, age 0–29, being the offspring of a household head, by age of mother: Republic of Korea, 1980 *29*
7. Actual and projected number of surviving parents ages 65 and older per surviving offspring, by age of offspring: Republic of Korea, 1960–2020 *34*

Exhibits

A. Input file: country.HW.DATA *45*
B. Input file: country.MEM.DATA *46*
C. Input file: country.IGW.DATA *47*
D. Input file: country.CIV.DATA *48*
E. Input file: country.POP.DATA *48*
F. Input file: country.FERT.DATA *49*
G. Table of contents for HOMES output *50*
H. Output files for HOMES *51*

TABLES

1. Actual and projected number of households, population size, and average household size: Republic of Korea, 1960–2000 *3*
2. Household types: Republic of Korea, 1980 and 2000 *4*
3. Age of household heads, by sex: Republic of Korea, 1980 and 2000 *4*
4. Average household size, by household type: Republic of Korea, 1980–2000 *5*
5. Average household size, by age of head: Republic of Korea, 1980–2000 *5*
6. Average number of household members in family households, by age of members: Republic of Korea, 1980 and 2000 *6*
7. Number and age of household members (1,000s), by age and sex of head: Republic of Korea, 1980 *6*
8. Average number of household members in each relationship category, by age of head: Republic of Korea, 1980 *7*
9. Actual and projected percent distribution of household members, by relationship category: Republic of Korea, 1980 and 2000 *8*
10. Percent distribution of households and population, by household type: Six Asian countries, 1970–1980 *10*
11. Marital status of men and women ages 65 and older: Six Asian countries, 1980 *15*
12. Changes in headship rates, by age and sex: Four Asian countries, 1960–1980 *16*
13. Calculation of actual and projected headship rates among men of ages 40–44: Republic of Korea, 1980 and 2000 *19*
14. Percent distribution of household members, by relationship category: Six Asian countries, 1970–1980 *20*
15. Percent distribution of household members, by relationship category and household type: Philippines, 1975, and Taiwan, 1980 *21*
16. Proportion of women over age 15 who are spouses of a household head, by age group: Six Asian countries, 1970–1980 *22*
17. Age differences between household heads and spouses *23*
18. Proportion of females under age 40 who are daughters of a household head, by age group: Six Asian countries, 1970–1980 *24*

19. Illustration of methodology for projecting offspring of a household head (sons of ages 0–4): Malay heads, Malaysia, 1980 *26*
20. Proportion of girls under age 15 who are grandchildren of a household head: Six Asian countries, 1970–1980 30
21. Illustration of methodology for calculating the number of grandchildren of household heads: Republic of Korea, 1980 *31*
22. Proportion of women over age 39 who are mothers of a household head: Six Asian countries, 1970–1980 *32*
23. Potential and actual mothers per offspring and the likelihood of coresidence: Malaysia, 1980 *33*
24. Number of other household members per thousand households, by household type: Republic of Korea, 1980 *35*

PREFACE

The research effort that led to the development of this model and computer package was motivated by a desire to improve the scope and quality of demographic information available in Asia and the Pacific. Many countries of the region are experiencing dramatic reductions in fertility and mortality that are causing fundamental changes in the characteristics of their populations. These transformations are fairly well understood, and more and more countries are factoring basic demographic change into their planning efforts and their formulations of economic and social policy.

The most immediate and perhaps most important impact of demographic change is on the character of the family and the household. Fertility decline means fewer children to rear and, typically, a shorter childrearing span. Over time it also means fewer adults to share the support of aging parents. Mortality decline has increased the likelihood that family members of any age will be alive and has reduced the chances that important family links will be severed by death. For the most part, however, the effects of demographic change on the household have not been comprehensively addressed in economic and social policy. Statistical and planning agencies in most countries do not project even the number of households, much less their demographic composition.

Why is it important to have this information? An increasing body of research points to the importance of the household as a determinant of social and economic behavior. Women who have young children behave differently from women who do not. Children raised in homes with both parents present differ from those raised by a single parent. What the household buys and what the household owns vary with the number of members, their age, and their sex. The living standard of most people depends as much on the earnings of other members of the household as it does on their own. It is hoped that improving the availability of information about the household and how it is likely to change will assist efforts to frame more effective policy and to improve social and economic planning.

The development of the HOMES model for household projections has benefited from the collaboration, support, and interest of a number of institutions and individuals to whom I am most grateful. Thus far, the model has been applied in six Asian countries, and detailed reports on those efforts will be available over the next few years. Research on Thailand is being conducted with Mathana Phananiramai and Nipon Poapongsakorn of Thamassat University and with the cooperation of the National Economic and Social Development Board and the National Statistical Office. Analysis of data from the Philippines and Taiwan has been a joint effort by Linda G. Martin of the East-West Population Institute and, for Taiwan, Chung-Chen Lin, Institute of the Three Principles of the People, Academia Sinica, Taipei, and, for the Philippines, Cristela Goce of the University of the Philip-

pines with the cooperation of the National Census and Statistics Office. Analysis of Indonesian data has been assisted by Sisdjiatmo Kusumosuwidho of Lembaga Demografi. In Malaysia application of the method was carried out as part of a project undertaken by the Economic Planning Unit, with the support of the United Nations Fund for Population Activities, to assess the long-run implications of population growth. I appreciate the support and suggestions of Abu Bakar Abdul Karim, David Demery, Kwok Kwan Kit, and Richard Leete. The analysis of data from the Republic of Korea is a collaborative effort with Sung-Yeal Koo, Yonsei University, and the General Motors Research Laboratory.

Colleagues and coworkers at the East-West Population Institute have contributed to this effort. Besides participating in the analysis of data from the Philippines and Taiwan, Linda G. Martin has been my coauthor of papers that developed many of the principles applied here. Her advice has been most helpful. Burnham O. Campbell has offered many useful suggestions. John Bauer and Robert Kleinbaum have provided helpful insights in their research assessing the implications of HOMES for changes in labor force participation and consumer expenditures. Lee-Jay Cho, director of the institute, has lent his active support to this project, contributing to it in many ways. Very capable research assistance has been provided by Teh Yoke Yun, Yulin Chang, and Laura Shrestha. Norma Uejo and Loretta Koga have provided efficient secretarial help. Allison Greenspan and Sandra Ward gave the manuscript careful editorial attention. Writing the computer programs for HOMES has been a major undertaking, and I am very grateful to Wayne Shima for his efforts.

The Office of Population, U.S. Agency for International Development, provided partial support under AID Cooperative Agreement No DPE-3000-A-00-3069-00 and AID Contract No DSPE-C-002 for the research on HOMES and publication of this paper.

ABSTRACT This paper is a reference guide for the use of HOMES, a demographic model and computer package developed to project the number and demographic characteristics of households. To familiarize the reader with the range of information available from HOMES, a summary of its application to the Republic of Korea is provided. A detailed discussion of the principles that underlie the computer model is reported and illustrated using census and survey data from Thailand, Indonesia, the Philippines, Taiwan, and Malaysia, in addition to the Republic of Korea. Detailed specifications of HOMES, sample output, and procedures for running HOMES on a mainframe computer are also provided.

1 AN OVERVIEW OF HOMES

This paper is a reference guide for the use of HOMES, a computer package developed to project the number and demographic characteristics of households. By applying the package to standard population projections, the user is provided data on:

- number of households
- age and sex of the household head
- households with single heads
- one-person households
- average household size
- sex and age distribution of household members
- number of children and grandchildren
- number of parents

The number of households and the age and sex of household heads are standard information provided by most household projection models. Other models, however, do not treat the living arrangements of other members of the population in a comprehensive fashion. HOMES employs a unique methodology to determine the entire household membership—including the head, the spouse, children, grandchildren, parents, and other household members—in a fashion consistent with underlying mortality and fertility trends. If, for example, childbearing becomes more concentrated among women in their 20s, HOMES provides an accounting for this trend in its projection of the number of children in households in subsequent years. Or if mortality among the elderly declines, HOMES accounts for the impact on the number of households headed by elderly, the number of elderly living alone, and the number of persons living in households headed by their offspring.

General application

HOMES has been developed to project household composition in developing countries. With its emphasis on analyzing the effects of demographic change on both the number and the composition of households, it is particularly well suited for application to countries where extended or multigenerational families are prevalent. HOMES has been tested with and used to analyze data from various East and Southeast Asian countries, including the Republic of Korea, Taiwan, Indonesia, Thailand, Malaysia, and the Philippines.

The most reliable application of HOMES is to projecting households at the national level, but it has also been applied to ethnic groups among whom intermarriage is not common. Using HOMES to project households for other subnational groups, such as urban residents, presents no computational problems, but the results may be less reliable and therefore such analysis should be undertaken with care.

HOMES has been applied to national planning problems and to the analysis of interactions between economic and demographic change. Changes in the number and demographic characteristics of households are known to influence the demand for housing, expenditure patterns (for example, the share of the household budget devoted to food, clothing, and other items), and patterns of employment, particularly labor force participation by women. As the number of elderly persons increase, governments are becoming concerned with problems faced by the aged, including finding suitable living arrangements and dependency on adult children's support. HOMES provides basic demographic information needed to analyze these issues and to assess the importance of demographic change for a wide range of social and economic policies.

HOMES can be conceptualized as consisting of two stages. In stage 1 the rules governing household formation and composition are determined from base-year data. In stage 2 the number and composition of households are projected from the results of stage 1 combined with population projections. Stage 2 is run repeatedly to assess the implications of alternative populations projections. But stage 1 is run only when new information from a major survey or census becomes available.

The data requirements for HOMES are relatively modest. They consist of population projections that include age-specific fertility rates, and a recent census or large, representative survey that includes a household roster with the age, sex, and relationship to the household head of each household member. For a few countries, analysis of recent census data on household composition has been completed and application of HOMES requires only population projections.

This reference guide is organized as follows. To familiarize the reader with the range of information available from HOMES, the remainder of this section illustrates the application of HOMES with data from the Republic of Korea. Section 2 provides a more detailed discussion of the model and its application to six Asian countries. Section 3 provides specifications for the HOMES computer programs. Section 4 describes steps for running HOMES, including the setup of input data and the computer programs. Section 5 provides a complete description of the computer output from HOMES.

Application of HOMES to the Republic of Korea

The information provided by HOMES is illustrated with an application to census data from the Republic of Korea. The number of households and the size of the civilian, noninstitutionalized population are projected to the year 2000 (Table 1). The projections show the average number of members per household to decline throughout the remainder of this century to 3.4 by the year 2000. There are no computational limits to how far forward in time households can be projected, so long as the required population projections are available.

The projections differentiate family households (those consisting of members who are related) from nonfamily households. Family households include intact households (those with a head and wife present) and single-headed households (those in which the head's spouse is absent). Nonfamily households include one-person households and primary-individual households (those with six or fewer unrelated members). Table 2, which shows the number and percentage of each household type by sex of the household head, does so only for 1980 and 2000; but these data and all other data reported in subsequent tables are available at five-year intervals for the entire projection span. Backward projection using historical population data is also easily accomplished.

Table 1. Actual and projected number of households, population size, and average household size: Republic of Korea, 1960–2000

Year	Number of households	Population (1,000s)	Average household size
1960	4,378	24,989	5.7
1966	5,192	29,160	5.6
1970	5,857	31,435	5.4
1975	6,761	34,769	5.1
1980	8,133	37,049	4.6
1985	9,529	39,902	4.2
1990	10,908	42,399	3.9
1995	12,302	44,743	3.6
2000	13,621	46,868	3.4

Note: Data for 1975 and earlier are census data and not adjusted for underenumeration. Population data for 1980 and later are adjusted for underenumeration and include only civilian, noninstitutionalized population.

Table 2. Household types: Republic of Korea, 1980 and 2000

Household type	1980 Number (1,000s)	1980 %	2000 Number (1,000s)	2000 %
Family households				
Intact	6,299	77.5	10,703	78.6
Single-head				
Male	379	4.6	583	4.3
Female	910	11.2	1,535	11.3
All family households	7,589	93.3	12,821	94.1
Non-family households				
Primary-individual				
Male	56	0.7	62	0.5
Female	63	0.8	72	0.5
One-person				
Male	149	1.8	213	1.6
Female	276	3.4	454	3.3
All nonfamily households	544	6.7	800	5.9
All household types	8,133	100.0	13,621	100.0

Note: Columns may not sum to totals because of rounding.

Table 3. Age of household heads, by sex: Republic of Korea, 1980 and 2000

Age of head	1980 Number (1,000s)	1980 %	2000 Number (1,000s)	2000 %
Male heads				
15–34	2,162	31.4	3,001	25.9
35–49	2,894	42.1	5,158	44.6
50–64	1,433	20.8	2,636	22.8
65+	393	5.7	766	6.7
Total	6,882	100.0	11,561	100.0
Female heads				
15–34	339	27.1	408	19.8
35–49	384	30.7	670	32.5
50–64	386	30.9	687	33.4
65+	141	11.3	295	14.3
Total	1,250	100.0	2,060	100.0

Household projections tabulated by the age and sex of the household head are also available. Table 3 reports this information with four broad age categories aggregated from five-year age group data generated as primary output by HOMES.

HOMES calculates the number of members residing in each type of household. These data, when combined with the number of households of each type, can be used to calculate the average number of members per household (Table 4).

Table 5 shows how average household size varies with the age of the head and how it is projected to change in the future.

Information on the age and sex of household members is available. Table 6 shows the average number of members in three broad age categories

Table 4. Average household size, by household type: Republic of Korea, 1980–2000

Household type	1980	1985	1990	1995	2000
Family households					
Intact	5.0	4.6	4.3	4.0	3.8
Single-head					
Male	3.6	3.1	2.8	2.5	2.5
Female	3.8	3.3	3.0	2.7	2.5
Non-family households					
Primary-individual					
Male	2.2	3.1	4.3	3.5	3.8
Female	1.9	2.4	2.4	2.2	1.7
One-person					
Male	1.0	1.0	1.0	1.0	1.0
Female	1.0	1.0	1.0	1.0	1.0
All household types	4.6	4.2	3.9	3.6	3.4

Table 5. Average household size, by age of head: Republic of Korea, 1980–2000

Age of head	1980	1985	1990	1995	2000
15–34	5.49	5.20	5.08	4.96	4.88
35–49	4.90	4.46	4.12	4.09	4.05
50–64	3.36	3.02	2.72	2.58	2.73
65+	2.17	1.69	1.35	1.39	1.80

Table 6. Average number of household members in family households, by age of members: Republic of Korea, 1980 and 2000

Year and household type	Combined	Age of members						Dependency ratio
		0–14		15–64		65+		
		Male	Female	Male	Female	Male	Female	
1980								
Intact	5.0	0.95	0.89	1.53	1.44	0.04	0.14	0.68
Single-head								
Male	3.8	0.43	0.38	1.70	1.07	0.07	0.13	0.36
Female	3.8	0.60	0.55	0.85	1.59	0.01	0.21	0.56
2000								
Intact	3.8	0.49	0.45	1.34	1.28	0.09	0.13	0.44
Single-head								
Male	2.5	0.15	0.14	1.39	0.54	0.16	0.12	0.30
Female	2.5	0.26	0.23	0.56	1.28	0.01	0.17	0.36

Note: Dependency ratio is the population under age 15 and over age 65 divided by the population of ages 15–64.

Table 7. Number and age of household members (1,000s), by age and sex of head: Republic of Korea, 1980

Household type and age group	Combined	Age of members					
		0–14		15–64		65+	
		Male	Female	Male	Female	Male	Female
Male heads							
15–34	12,875	2,846	2,673	3,732	3,410	51	163
35–49	14,566	2,781	2,566	4,544	4,245	96	333
50–64	4,882	425	394	1,893	1,859	227	84
65+	803	99	89	175	140	163	137
All male heads	33,126	6,151	5,723	10,344	9,654	537	717
Female heads							
15–34	852	133	126	62	525	1	5
35–49	1,492	270	251	293	649	3	26
50–64	1,224	101	97	347	661	2	15
65+	354	42	34	68	64	—	146
All female heads	3,923	546	508	770	1,900	6	193

Note: Columns may not sum to totals because of rounding.

for family households in 1980 and 2000. The same information is also available for nonfamily households.

Table 7 reports the number and age of members in broad age categories, by the age and sex of the household heads. The average number of members can also be calculated.

HOMES also projects the relationship of household members to the household head. Table 8 reports the average number of males and females in each relationship category: head, spouse, child, grandchild, parent, and other.

Table 9 reports the percentage of males and females falling into each relationship category for 1980 and projected to 2000.

Table 8. Average number of household members in each relationship category, by age of head: Republic of Korea, 1980

Relationship category	Combined	Age of head			
		15–34	35–49	50–64	65+
Head					
Male	0.85	0.90	0.87	0.73	0.56
Female	0.15	0.10	0.13	0.27	0.44
Spouse	0.77	0.79	0.84	0.67	0.41
Child					
Male	1.17	0.85	1.66	1.08	0.37
Female	1.06	0.80	1.50	0.92	0.37
Grandchild					
Male	0.07	0.00	0.02	0.23	0.57
Female	0.06	0.00	0.01	0.21	0.48
Parent					
Male	0.02	0.02	0.03	0.01	0.00
Female	0.13	0.15	0.15	0.07	0.01
Others					
Male	0.15	0.23	0.10	0.07	0.05
Female	0.12	0.19	0.07	0.06	0.06
Combined					
Male	2.26	2.01	2.68	2.12	1.56
Female	2.30	2.03	2.71	2.20	1.76

Table 9. Actual and projected percent distribution of household members, by relationship category: Republic of Korea, 1980 and 2000

Relationship category	1980			2000		
	Male	Female	Combined	Male	Female	Combined
Head	18.6	3.4	22.0	24.7	4.4	29.1
Spouse	—	17.0	17.0	—	22.8	22.8
Child	25.7	23.3	49.0	19.4	16.9	36.2
Grandchild	1.5	1.3	2.9	1.1	0.9	2.0
Parents	0.5	2.8	3.3	0.8	4.3	5.1
Other	3.2	2.6	5.8	3.6	1.2	4.8
Total	49.5	50.5	100.0	49.6	50.5	100.0

Note: Columns may not sum to totals because of rounding.

2 DESCRIPTION OF THE MODEL

Projecting the number and type of households

One of the primary objectives of HOMES is to project the number of households. The model uses a headship method whereby age- and sex-specific headship rates are multiplied by projected population data to obtain the number of household heads and, hence, the number of households.[1] Headship rates are calculated from census samples by dividing the number of household heads by the population of each age–sex group. Four types of households are distinguished: (1) intact households, households headed by a male with the spouse present; (2) single-headed households, households in which the head's spouse is not present; (3) one-person households; and (4) primary-individual households, households consisting of unrelated members. These four categories encompass all members of the population except the military and institutionalized populations, which are projected separately. The categorization of households is used for both methodological and substantive reasons. The average household size and composition vary considerably among the four types. For example, households in which the head and spouse are both present generally have more children living at home. Parents-in-law rarely live in households that are not intact. No relatives reside in one person and primary-individual households. Differences in household composition, in turn, affect behavior and social and economic status. In many countries, women who are household heads are more likely to work, for example, and intact households frequently enjoy higher standards of living than households with single heads.

In the East and Southeast Asian countries for which data have been analyzed,[2] intact households are the dominant household type (Table 10). Between 70 and 85 percent of all households are headed by a husband and wife. Likewise, the majority of the population—80 to 90 percent—of each country analyzed live in intact households. Households with a single head make up between 10 and 20 percent of all households and of the population. Single heads are considerably more likely to be women than men except in Taiwan. Although approximately 5 percent of all households in most of the countries are one-person households, only 1 percent or less of the

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[1] In all the results reported here, I have followed the convention of designating the husband, if present, the head of household, a practice in conformance with census procedures in most countries. There are some cases in Thailand where women are designated the head of intact households. I have changed their relationship to spouse of head and their husband's to household head.

[2] Data sources include the 1976 Intercensal Survey of Indonesia; the 1970 and 1980 Censuses of the Republic of Korea; the 1980 Census of Malaysia; the 1975 Census of the Philippines; the 1980 Consumer Expenditure Survey of Taiwan; and the 1970 and 1980 Censuses of Thailand.

Table 10. Percent distribution of households and population, by household type: Six Asian countries, 1970–1980

	Household type						
		Single-headed		One-person		Primary-individual	
Country (year)	Intact	Male	Female	Male	Female	Male	Female
Households							
Indonesia (1976)	80.7	3.1	11.3	1.0	3.6	0.1	*
Republic of Korea (1970)	83.0	6.2	10.3	0.3	0.3	n.a.	n.a.
Republic of Korea (1980)	77.5	4.6	11.2	1.8	3.4	0.7	0.8
Malaysia (1980)	70.8	6.8	13.3	5.8	3.3	n.a.	n.a.
Philippines (1975)	84.9	5.4	7.1	1.4	0.8	0.3	0.1
Taiwan (1980)	84.4	7.7	4.1	3.1	0.8	*	*
Thailand (1970)	79.5	4.4	12.5	1.6	1.5	0.3	0.1
Thailand (1980)	78.0	4.7	13.0	1.8	1.8	0.5	0.3
Population							
Indonesia (1976)	87.3	2.6	9.0	0.2	0.8	0.1	
Republic of Korea (1970)	87.6	4.9	7.4	*	0.1	n.a.	n.a.
Republic of Korea (1980)	84.8	3.7	9.3	0.4	0.7	1.0	
Malaysia (1980)	78.3	6.9	13.1	1.1	0.6	n.a.	n.a.
Philippines (1975)	89.2	4.2	5.9	0.2	0.1	0.2	
Taiwan (1980)	89.1	6.9	3.2	0.6	0.2	*	*
Thailand (1970)	84.3	3.9	11.0	0.3	0.3	0.2	
Thailand (1980)	82.6	4.3	11.8	0.3	0.4	0.5	

* Less than 0.1 percent.

n.a.—not ascertained.

population of each country lives in a one-person household. Primary-individual households are rare in East and Southeast Asia; only in Korea do primary-individual households make up as much as 1 percent of the total. Despite their infrequency, however, primary-individual and one-person households are becoming more prevalent, if the experience of Korea and Thailand can be taken as a guide.

Households are further distinguished by the age and sex of the head. Figure 1 shows headship rates for households headed by men and women, obtained from special census tabulations for four Asian countries. Detailed rates are reported in Appendix A for all six. The age pattern of headship is quite similiar in all of the countries studied. For men the likelihood of being a household head increases from low levels among those under age 25 to a peak among the middle-aged. Thereafter, the rate of male headship declines. The only exception to this pattern is Taiwan. Headship rates for

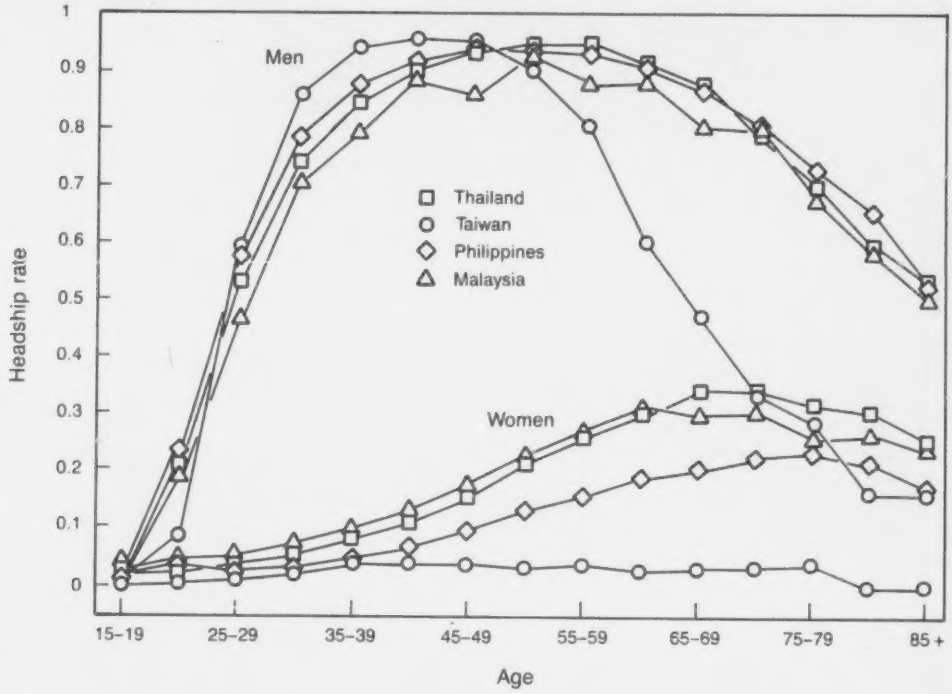

Figure 1. Headship rates for men and women, by age group: Thailand, Taiwan, the Philippines, and Malaysia, recent years

Taiwan decline much more precipitously among middle-aged men as their sons take over headship of the household. This difference is, however, largely a difference in definitions; the consumer expenditure survey on which the Taiwan data are based defines headship according to economic contribution to the household. Headship rates for women are substantially lower than for men, with a very different age pattern. Headship rates increase more slowly for young women than for young men, and the peak, if any, is much less clearly demarcated. For women in Indonesia (not shown), Malaysia, the Philippines, and Thailand headship rates increase up into the 60s and 70s. Among the countries studied the peak is earliest among Korean women, for whom headship rates peak at ages 55–59 (Appendix A).

Distinguishing among the different types of households requires more detailed rates than those shown in Figure 1. HOMES projects intact, single-headed, one-person, and primary-individual households based on headship rates (Appendix A) specific to each household type.

Intact households

Headship rates for intact households are quite similiar to overall headship rates for men. Rates increase as men marry and establish households separate from their conjugal family or, remain in their conjugal family but receive the headship mantle from their father. The age of household headship varies, however, from country to country. In Indonesia, the Philippines, and Thailand, 15 to 25 percent of all men of ages 20–24 are the heads of intact households, whereas in the Republic of Korea and Taiwan fewer than 6 percent of men in this age group head intact households. Among men in their early 30s, however, from 70 to 80 percent head intact households. For men in their 40s, the rate increases to 85 to 95 percent in all of the countries studied.

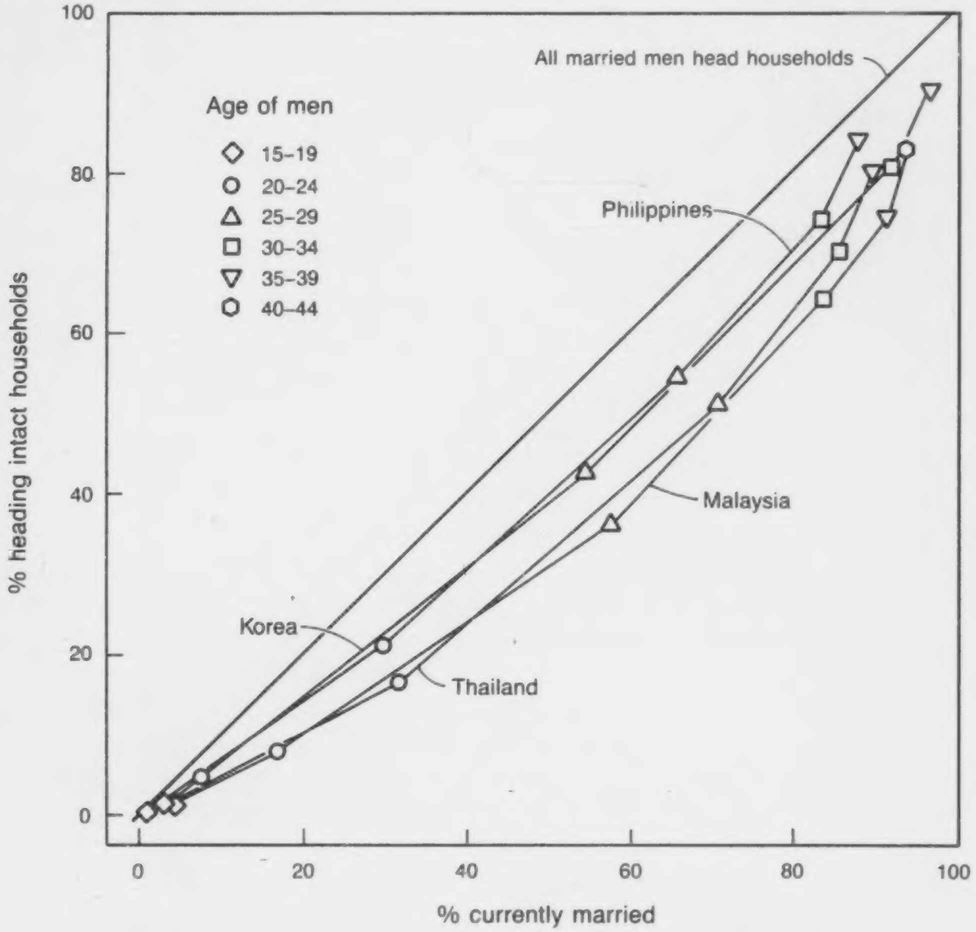

Figure 2. Relationship of marriage to intact household headship among men in Thailand, Republic of Korea, the Philippines, and Malaysia, recent years

Age at marriage is an important proximate determinant of the timing of intact headship. Using the most recently available data, the percentage of men heading intact households is plotted against the percentage married for four countries in Figure 2. Were household structure purely nuclear, the plotted lines would lie along the principal diagonal because all married men would be household heads. The vertical distance from the diagonal gives the percentage of men who are married and not the heads of households. Becoming a household head, then, is closely related to marriage, but many men do not become household heads immediately. In particular, the delays in Indonesia (not shown), Malaysia, and Thailand are somewhat greater than in the Republic of Korea, the Philippines, and Taiwan (not shown).

As men proceed through their 50s and into their later years, fewer continue to head households. The pace at which the rates decline varies, however, from country to country. Of men between ages 75 and 79, nearly 70 percent head intact households in Indonesia, in contrast to barely 20 percent in Taiwan. The decline in intact household headship is counterbalanced in part by the increase in single headship—the shift being a consequence of mortality among wives. The remaining decline in intact headship is almost entirely a consequence of a shift of the head designation to a son or son-in-law. What determines the age at which the shift occurs? Analysis of data reported in Mason and Martin (1985) shows a rough correlation between the headship transition and the completion of childrearing. The phenomenon is particularly noteworthy in Taiwan, where the decline in headship is greatest (Freedman et al. 1978, 1982).

Single-headed and nonfamily households

Headship rates for single-headed and one-person households vary substantially with the age and sex of the head (Figure 3). In general, young adults are somewhat more likely to head nonintact households than are middle-aged adults, but headship rates are particularly high among older women and, to a lesser extent, older men. The increase in single headship for men and women is primarily a consequence of mortality among spouses. The fact that women have greater longevity and are thus more likely to be widowed than are men is one of the principal reasons for the high rates of single headship among women. Of course, the data on marital status for the elderly presented in Table 11 do not indicate the extent to which men are less likely to be widowed because they have remarried. For women, the decline in single headship at older ages, where observed, is associated with the completion of childrearing, at which time adult sons assume headship of the household (Mason and Martin 1986). Nonfamily households (one-person and primary-individual households) are uncommon in Asian countries. The detailed headship rates in Appendix A show that headship rates for one-person households rarely exceed 10 percent and for primary-

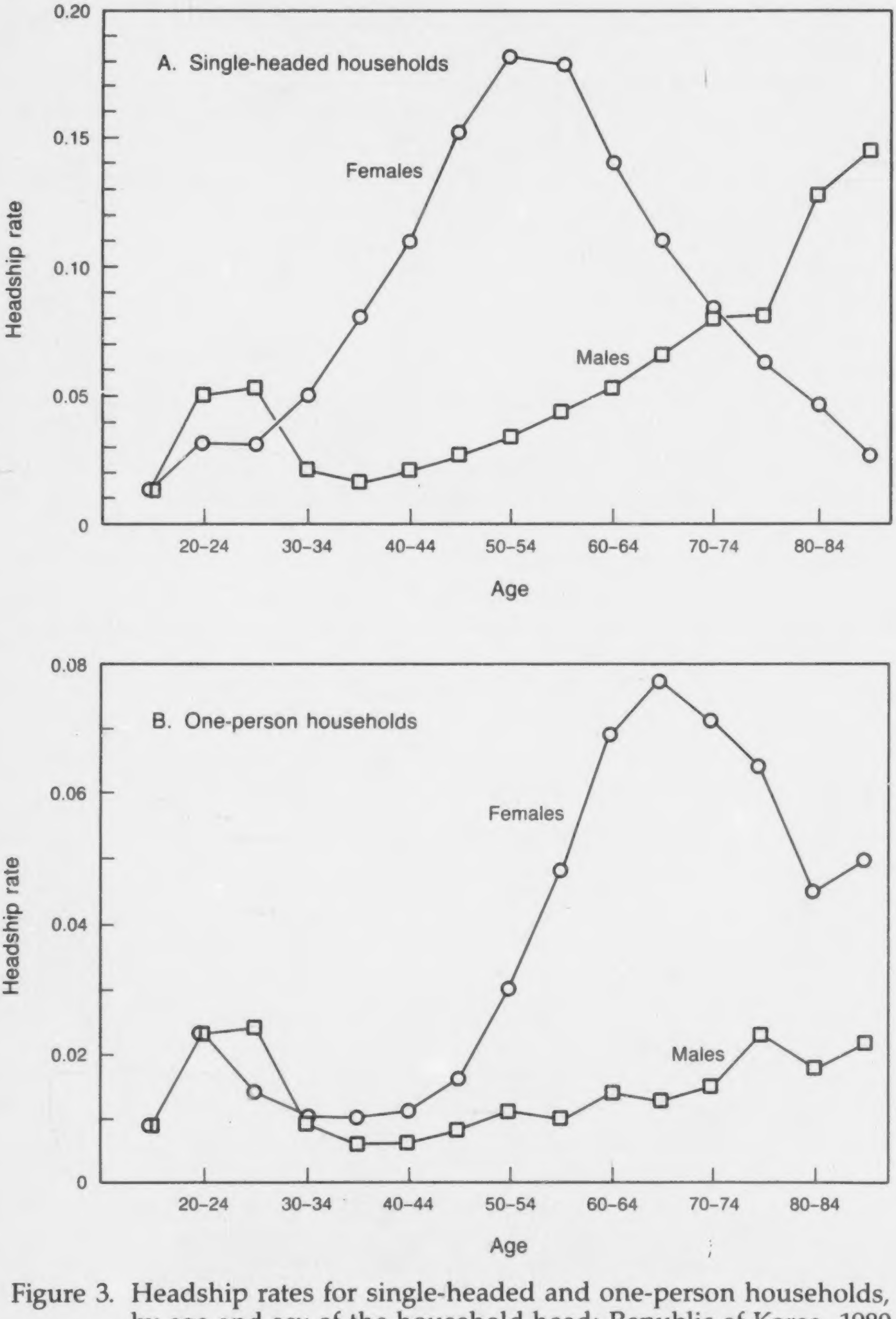

Figure 3. Headship rates for single-headed and one-person households, by age and sex of the household head: Republic of Korea, 1980

Table 11. Marital status of men and women ages 65 and older: Six Asian countries, 1980

Country (year)	Single	Married	Widowed	Divorced
Indonesia (1980)				
Male	0.013	0.813	0.154	0.020
Female	0.014	0.251	0.682	0.053
Republic of Korea (1980)				
Male	0.002	0.799	0.197	0.002
Female	0.001	0.243	0.754	0.002
Malaysia (1980)				
Male	0.038	0.761	0.172	0.030
Female	0.021	0.297	0.608	0.073
Philippines (1980)				
Male	0.034	0.762	0.193	0.007
Female	0.082	0.410	0.496	0.009
Taiwan (1980)				
Male	0.105	0.655	0.203	0.037
Female	0.010	0.403	0.575	0.012
Thailand (1980)				
Male	0.014	0.712	0.206	0.020
Female	0.019	0.335	0.584	0.024

Sources: Martin (1985); Taiwan Bureau of Statistics (1985).

individual households rarely exceed 1 percent. One-person households are, in general, considerably more prevalent among the elderly than among younger adults. Among men, rates of one-person headship are highest in Taiwan and lowest in the Republic of Korea. Among women, rates are lowest in Taiwan and highest in Indonesia, approaching 20 percent among women of ages 75–84. Primary-individual households are rare, but rates have increased marginally in recent years and households with unrelated individuals may become more important in the future.

Projecting trends in headship rates

Although many applications of the headship rate method have held rates constant at their base-year values, it is increasingly common to provide for changing headship rates, either by extrapolating the recent trend (U.S. Bureau of the Census 1979) or by tying headship rates to a measure of socioeconomic development. The United Nations (1981:12) report on household projections concludes that:

> The available data indicate that headship rates have generally increased over time in all age–sex groups. . . . These increases are suspected to

> be related to rapid economic growth, which has occurred in many developed countries in the 1960s. Higher levels of economic growth and development definitely favor increased nuclearization of households. . . .

Data are not adequate to extend this generalization to developing or to Asian countries. The United Nations study reports headship rates at two time points for only four developing countries and for only two Asian countries, Japan and Singapore. This Asian data, supplemented with headship rates for the Republic of Korea and Thailand, are presented in Table 12 and support a somewhat weaker conclusion. Except for Japan, headship rates

Table 12. Changes in headship rates, by age and sex: Four Asian countries, 1960-1980

	Age					
Country (year)	15-24	25-34	35-44	45-54	55-64	65+
Singapore (1966)[a]						
Male	7.1	49.8	80.5	88.9	85.7	63.0
Female	1.1	5.3	11.5	22.6	28.3	24.7
Singapore (1970)						
Male	6.3	49.9	79.9	85.5	81.8	65.6
Female	2.0	6.4	14.0	24.8	20.1	24.2
Japan (1960)[a]						
Male	4.3	51.5	81.7	92.7	91.1	63.1
Female	1.0	3.3	10.5	17.5	14.4	10.4
Japan (1970)						
Male	11.3	61.5	82.7	91.3	91.7	68.2
Female	3.9	4.3	7.9	15.9	18.5	13.2
Republic of Korea (1970)[b]						
Male	5.9	65.2	92.6	96.5	91.2	62.7
Female	1.4	3.6	10.6	14.8	11.1	5.6
Republic of Korea (1980)						
Male	6.7	67.7	93.8	96.7	93.9	69.9
Female	4.5	5.6	10.8	19.0	22.0	15.6
Thailand (1970)[b]						
Male	11.0	65.2	88.0	94.2	91.7	76.0
Female	1.0	3.6	9.1	19.5	27.8	29.6
Thailand (1980)						
Male	11.0	63.4	87.3	94.2	93.1	78.9
Female	1.4	4.2	9.4	18.1	28.0	32.9

a. Source of data for Singapore and Japan: United Nations (1981).

b. Values are simple averages of five-year group ratios; 65+ is a simple average of ages 65-69, 70-74, and 75-79. Data for Republic of Korea and Thailand are from Appendix A.

for men have been relatively constant. Of the twenty-four age–country categories for men, about one-half show increases of more than 0.2 percent and about one-third show declines of more than 0.2 percentage points. Among women, about three-quarters of the values increase and about one-quarter decline. Thus, among these four Asian countries, the overall trend, particularly among women, appears to be toward higher headship rates, but increases are by no means uniform and at many ages rates have declined.

Any conclusion about why headship rates have changed is probably premature. In many countries, changes are correlated with socioeconomic development, but underlying demographic changes—changes in mortality, fertility, and the sex ratio—probably play an important role as well. The impact of changes in the sex ratio, in particular, has been neglected. Intact households provide a clear case in which ignoring the sex ratio is unwise. Fixed headship rates imply changing "spouseship" rates and, given declines in the relative number of available women, the required number of spouses may even exceed the number available.

Changes in headship (and marriage) should be influenced by changes in the relative number of women of marriageable age. Women in the Asian countries examined here most frequently marry men somewhat older than themselves. Fluctuations in the sex ratio are illustrated in Figure 4, which charts the number of women ages 45–49 divided by the number of men ages 50–54 in Indonesia, the Republic of Korea, and Thailand. The ratio has changed radically in these countries over the last twenty-five years and is expected to change radically in the future, as well. A number of factors account for the shifts observed. Age–sex selective mortality is important in countries with war-time experience, such as the Republic of Korea. Age–sex selective migration is important in other countries, such as Taiwan. Sudden changes in fertility, experienced in a number of Asian countries, also affect the sex ratio.

HOMES captures the impact of the changing sex ratio on intact household headship, as shown in equation (1):

$$h_t(x) = h_0(x) \sum_{w} d_0(x,w)[(1+s_t(x,w))/(1+s_0(x,w))] \qquad (1)$$

where h is the headship rate for men age x in the current or in the base year, d is the fraction of heads age x married to women age w in the base year, and s is the ratio of women age w to men age x in the current or the base year. The summation term is a weighted average of a measure of the change in the sex ratio, where the weights depend on the age distribution of marriage for intact household heads and their wives. Headship rates for nonintact households are held constant at the base-year levels.

Table 13 shows the application of the procedure to Korean men ages 40–44. Column 2 shows the age distribution of wives married to house-

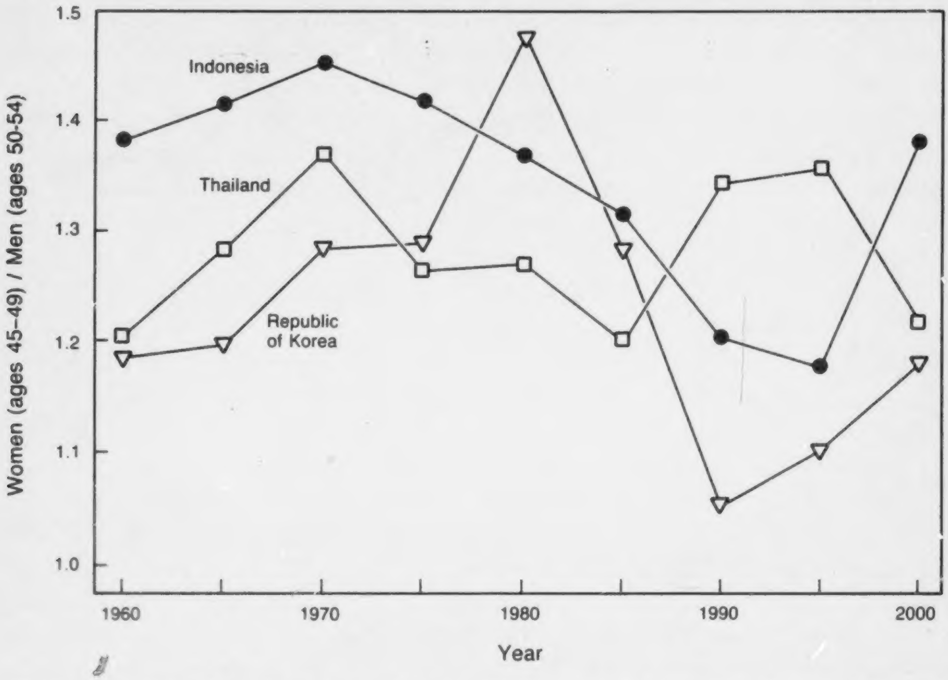

Figure 4. Actual and projected sex ratio trends: Indonesia, Thailand, and Republic of Korea, 1960–2000

hold heads ages 40–44. Because the majority are between the ages of 30 and 44 changes in the availability of women in these age groups will primarily determine changes in the headship rate. Column 7 shows a decline in the availability of women ages 30–34 (the value is less than one) but an increase in the availability of women ages 35–44 (the values exceed one). The net impact of changes in the sex ratio is quite small, effecting an increase in the headship rate of only 0.18 percent (the last value in column 8 is 1.0018). Hence, the headship rate is calculated to increase from 0.914 to 0.916 for men ages 40–44.

Projecting household membership

For each type of household, HOMES projects the number of male and female members in five-year age groups, based on the members' relationship to the head. Five relationships are distinguished: spouses, children, grandchildren, parents, and other household members. Because household structure in the East and Southeast Asian countries studied is predominantly lineal, children, grandchildren, and parents, along with heads and spouses, make up the majority of household members. As shown in Table

14, fewer than 10 percent (Malaysia excepted) of the household members fall in the residual category, "other members." Children are the most prevalent household members, composing close to half of all members in all countries. Parents and grandchildren are relatively rare, together making up less than 10 percent of the household members, even though the extended family is the prevailing norm in the countries represented.

Household membership varies considerably depending on the type of household. As illustrated by Table 15, which reports data for the Philippines and Taiwan, children are less frequently found in households with single heads and particularly single male heads than in intact households. In both countries, other household members, and in Taiwan parents of heads, are much more frequently observed in households headed by a single person.

HOMES projects household membership separately for each type of household. The following sections describe current characteristics of household composition and the procedures used to project changes in household composition.

Number of spouses

In all of the countries considered, the majority of women marry and with their husbands establish households, thus fulfilling the two conditions for being designated the spouse of a household head. The data in Table 16 report the proportion of women, by age group, who are spouses of a household head. In each country the likelihood of being a spouse increases through the 20s and early 30s, peaking among women in their 30s or early 40s. Thereafter, women are less likely to be the spouse of a household head.

Table 14. Percent distribution of household members, by relationship category: Six Asian countries, 1970–1980

	Relationship category					
Country (year)	Head	Spouse	Child	Grand-child	Parent	Other
Indonesia (1976)	20.6	17.4	52.3	3.6	1.4	4.8
Republic of Korea (1970)	18.6	15.5	51.5	3.2	3.7	7.6
Republic of Korea (1980)	21.9	16.9	48.9	2.9	3.3	5.8
Malaysia (1980)	18.8	13.3	47.5	5.3	1.8	13.4
Philippines (1975)	16.9	14.4	57.1	2.8	0.9	8.0
Taiwan (1980)	20.6	17.4	48.3	2.5	6.0	5.2
Thailand (1970)	17.5	14.0	56.1	5.1	0.8	6.6
Thailand (1980)	19.4	15.2	52.5	5.6	1.6	5.6

Table 15. Percent distribution of household members by relationship category and household type: Philippines, 1975, and Taiwan, 1980

Relationship category	Household type						
	Intact	Single-headed		One-person		Primary-individual	
		Male	Female	Male	Female	Male	Female
Philippines							
Head	16.1	21.4	20.4	100.0	100.0	28.0	
Spouse	16.1						
Child	58.4	39.3	56.4				
Grandchild	2.3	4.9	8.7				
Parent	0.8	3.1	1.0				
Other	6.3	31.3	13.6			72.0	
Total	100.0	100.0	100.0	100.0	100.0	100.0	
Taiwan							
Head	19.5	23.0	26.0	100.0	100.0		
Spouse	19.5						
Child	51.1	22.9	37.2				
Grandchild	2.3	4.6	3.1				
Parent	4.4	22.2	14.9				
Other	3.2	27.3	18.9				
Total	100.0	100.0	100.0	100.0	100.0		

There are important differences among countries in the age profile of spouses. In Thailand, for example, rates peak at a somewhat lower level than in other countries, reflecting higher rates of celibacy. A more rapid decline of rates among older women reflects, for Indonesia, higher rates of mortality among husbands and, for Taiwan, the transfer of headship to surviving sons (Mason and Martin 1985.)

HOMES not only projects the number of women in each age group who are spouses but also identifies the ages of their husbands. Table 17 shows the proportion of spouses ages 40–44 who are married to men younger, the same age, and older than themselves for each country. Typically, women in Asia marry men who are older than themselves. In the Philippines and Thailand, however, a substantial percentage of women marry younger men.

Projecting the number of spouses is intrinsically tied to the projection of intact households because each intact household implies one household head and one spouse. In the absence of changes in the sex ratio (both within and across age groups), the proportion of women in each age group

Table 13. Calculation of actual and projected headship rates among men of ages 40–44: Republic of Korea, 1980 and 2000

	Base-year data Men (40–44): 1,094,990 Headship rate: 0.914				Data for year 2000 Men (40–44): 1,967,694 Headship rate: 0.916			
	Number of spouses		Number of women		Sex ratio (s)			
Age of spouse	Actual (1)	Distribution (2)	1980 (3)	2000 (4)	1980 (5)	2000 (6)	[1 + s (2000)] ÷ [1 + s (1980)] (7)	Col. 2 × Col. 7 (8)
15–19	51	0.0001	2,076,360	1,823,548	1.896	0.927	0.665	0.0001
20–24	1,215	0.0012	1,955,909	1,828,127	1.786	0.929	0.692	0.0008
25–29	17,375	0.0174	1,480,609	2,117,104	1.352	1.076	0.883	0.0154
30–34	166,924	0.1668	1,202,050	2,078,702	1.098	1.056	0.980	0.1635
35–39	495,362	0.4950	1,108,531	2,034,701	1.012	1.034	1.011	0.5004
40–44	300,160	0.2999	1,065,223	1,953,538	0.973	0.993	1.010	0.3029
45–49	18,933	0.0189	894,557	1,441,981	0.817	0.733	0.954	0.0180
50–54	337	0.0003	716,293	1,168,655	0.654	0.594	0.964	0.0003
55–59	258	0.0003	601,678	1,030,022	0.549	0.523	0.983	0.0003
60–64	44	0.0000	452,815	955,896	0.414	0.486	1.051	0.0000
65–69	47	0.0000	360,016	756,719	0.329	0.385	1.042	0.0000
70–74	0	0.0000	264,759	538,098	0.242	0.273	1.025	0.0000
75–79	45	0.0000	156,156	334,505	0.143	0.170	1.024	0.0000
80–84	0	0.0000	86,698	187,068	0.079	0.095	1.015	0.0000
85+	0	0.0000	41,576	89,536	0.038	0.046	1.008	0.0000
Total	1,000,751	1.0000	12,463,230	18,338,200				1.0018

Notes: Data in columns 1 and 3 were obtained from the 1980 census; data in Column 4 are from population projections. Column 2 is based on Column 1. Columns 5 and 6 are the ratios of women of each age group to men of ages 40–44.

Table 17. Age differences between household heads and spouses

	Age of household head			
Country (year)	Younger	Same age	5 years older	10+ years older
Indonesia (1975)	.044	.156	.407	.384
Republic of Korea (1970)	.017	.274	.410	.297
Republic of Korea (1980)	.019	.350	.487	.178
Malaysia (1980)	.057	.270	.345	.328
Philippines (1975)	.112	.364	.335	.189
Taiwan (1980)	.022	.384	.383	.209
Thailand (1970)	.092	.336	.359	.193
Thailand (1980)	.095	.362	.350	.186

Note: The age difference is measured using the midpoints of the five-year age groups to which spouse and head belong.

projected to be a spouse would be held constant. Furthermore, given unchanging sex ratios the joint age-distribution of heads and spouses would be held constant. As sex ratios do change over time, however, the proportion of women who are spouses changes. Declines in the relative availability of men lead to declines in the proportion of women who are the spouses of a household head. The proportion of women who are the spouses of a household head is calculated as:

$$h_t'(w) = h_0'(w) \sum_x d_0'(x,w)[(1+s_t'(x,w))/(1+s_0'(x,w))] \qquad (2)$$

where h' is the proportion of women aged w who are spouses, d' is the proportion of spouses age w with husbands age x, and s' is the ratio of men age x to women age w where subscripts indicate either the base year (0) or the year to be calculated (t). Equation (2) along with equation (1), which determines headship rates, ensure that the number of heads age x with wives age w equals the number of wives age w with husbands age x.

Number of children

Without exception, more people fall into the category of child of a household head than into any other relationship category, reflecting the young age structures of the countries reviewed and family structures in which many individuals remain the child of a household head into their 20s and even their 30s. Table 18 reports the proportion of females who are children of a household head for each country. For girls under age 15, between 75 and 90 percent are children of a household head. (Nearly all of the remaining are grandchildren of a head.) At older ages, as women establish households separate from their parents, a smaller proportion are children of a

Table 18. Proportion of females under age 40 who are daughters of a household head, by age group: Six Asian countries, 1970-1980

	Age group							
Country (year)	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39
Indonesia (1976)	.875	.916	.889	.708	.381	.165	.074	.035
Republic of Korea (1970)	.880	.898	.865	.664	.393	.147	.090	.054
Republic of Korea (1980)	.882	.929	.900	.695	.456	.175	.070	.043
Malaysia (1980)	.762	.830	.837	.678	.382	.182	.100	.053
Philippines (1975)	.879	.908	.884	.729	.465	.254	.128	.074
Taiwan (1980)	.835	.923	.923	.857	.497	.181	.052	.019
Thailand (1970)	.819	.872	.876	.788	.532	.300	.167	.102
Thailand (1980)	.747	.855	.873	.786	.541	.329	.201	.122

head. These proportions vary substantially, however, among the countries represented. At one extreme, Thai daughters are particularly likely to remain at home to an older age. Indonesian females, in contrast, are much less likely to be daughters of a household head after they reach their 20s and 30s.

Projecting the number of children of heads residing in households requires knowing the number of candidates for this type of household membership. That is, if all surviving offspring decided to live with their parents, how many of each age and sex would reside in each type of household?

This question can be answered using a technique introduced by Mason and Martin (1982). Suppose that there are 1 million boys who are 10 years old in 1980. All are candidates to be the son of a household head, but it is not known how they are distributed among the alternative households. Ignoring some minor details, all of the boys were born in 1970. Based on birth records, we know that, for example, 5 percent were born to women ages 15-19, 20 percent to women ages 20-24, and 35 percent to women ages 25-29. Therefore, in 1980, approximately 5 percent of the 10-year-old boys, or 50,000 of the 1 million surviving offspring, will be the sons of mothers who are currently ages 25-29 and candidates to be the son of a head in households with women ages 25-29. Likewise, 20 percent, or 200,000, of the boys will be the sons of women who are currently ages 30-34 and candidates for membership in households containing these women. The remaining 10-year-old sons, as well as sons and daughters of other ages, are distributed in the same way.

Figure 5 illustrates the use of offspring data from four Asian countries to show the impact of declining fertility on the number of children. Each panel shows the number of surviving offspring under age 15 divided by the total (male and female) population of the mother's cohort. In Japan, the number of young offspring per adult is not expected to decline much further from its already low level. But in the Republic of Korea, Thailand, and Indonesia substantial declines are anticipated. Thus, the number of children per household should decline in these countries, and because the timing of fertility is changing, children should be increasingly concentrated in households containing younger women.

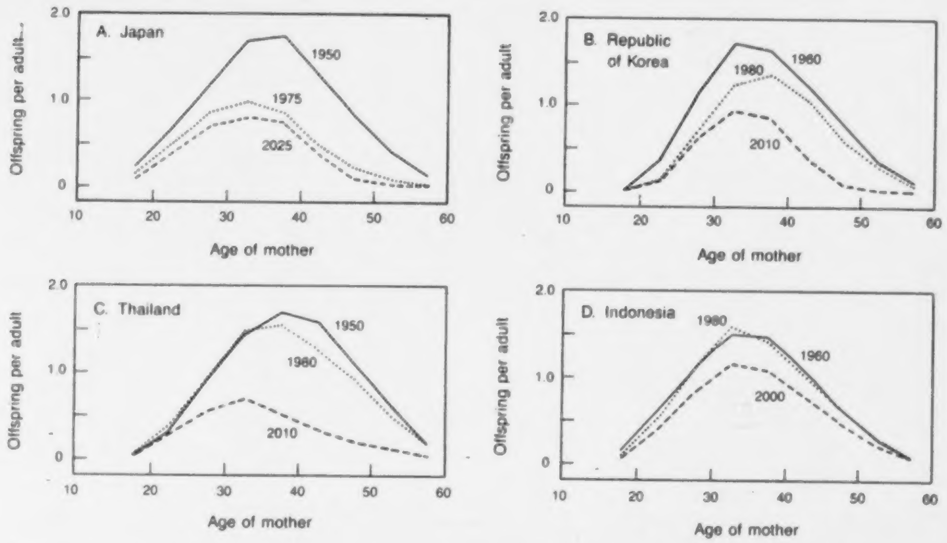

Figure 5. Actual and projected ratios of offspring under age 15 to adults, by age of mother: Japan, Republic of Korea, Thailand, and Indonesia

The offspring data quantify only the potential number of persons who may be the children of a household head. Some of those under age 15 will be the grandchild of a head or another household member, and, a small percentage of adults will be the children of a head. The HOMES model, however, combines the data on the number of offspring with the number of individuals observed to be the child of a head in the base year to calculate rates of incidence. The model uses these values in conjunction with projected offspring data to project the number of children of the household head.

Table 19 illustrates this procedure, with data for the Malay population of Malaysia. The first four rows report the number of sons who are living in households headed by their mother or their father as estimated from the 1980 census. Of the 449,190 Malay males of ages 0-4 in 1980, 367,256 (about 82 percent) were the sons of a household head. The remaining boys were grandsons of a household head or had another relationship to a head.

Rows five and six provide an estimate of the number of surviving male offspring. Dividing the number of sons by the number of surviving offspring yields an estimate, denoted *r2*, of the likelihood that surviving offspring will be sons of a household head.

Figure 6 shows the likelihood of being a son or daughter of a household head, as calculated from 1980 Korean census data. By the time children in the Republic of Korea reach their late teens, some are beginning to live away from their parents. Thus, the likelihood of being a son or daughter of a household head declines steadily with age. Because women marry at a younger age than do men, the likelihood of being the offspring of a household head is lower for females than for males in their 20s. Even among offspring under age 15, however, the likelihood of being the child of a head is generally below 1. Although nearly all children under age 15 live with their mothers or fathers, their mothers or fathers are not necessarily the household head; many parents of children under age 5 have not yet established separate households. Thus, a substantial percentage of these offspring are grandchildren rather than children of a household head.

The likelihood of being a child of a household head also varies with the age of the offspring's mother. Offspring of very young mothers may be less likely to be a child of a head because their parents cannot afford to establish their own households. On the other hand, offspring of older women may not be a child of a head because their mother and/or father is deceased. Offspring of older women are, on average, higher parity births and more likely to belong to families of lower socioeconomic status characterized by a more traditional family structure. Beyond behavioral, cultural, and demographic factors, the rates are affected by errors in calculating the distribution of surviving offspring, misreporting of age and relationship and other errors affecting the census data, and the inclusion of stepchildren, in-laws, and adopted children in the numerator.

Variation in the likelihood of older children being the offspring of a head also reflects intraclass variation. Because members of any cohort with older mothers are older than members of their cohort with younger mothers, they are less likely to live at home.

The remainder of Table 19 is devoted to procedures used to allocate the number of sons among the three household types. The principle underlying the calculations is that children will be distributed among households in proportion to the prevalence of those households. If the number of single-headed households increases relative to the number of intact households, then the number of children residing in single-headed households will increase in similiar fashion. The principle is made operational in the following way. For each age group, the distribution of households by type and the distribution of sons of household heads by type of household are both calculated. For example, intact households make up 90.3 percent of the

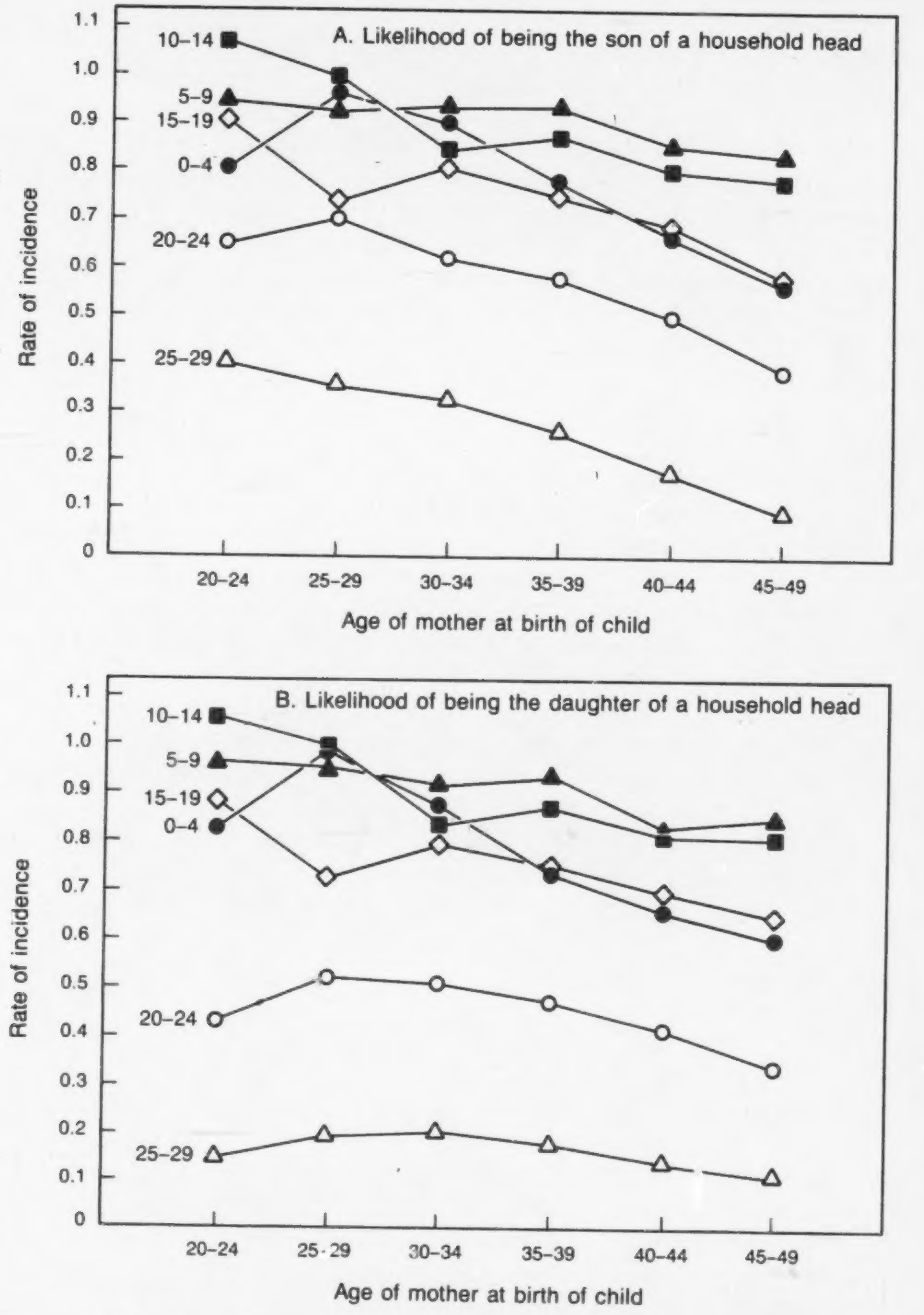

Figure 6. Likelihood of a child, age 0–29, being the offspring of a household head, by age of mother: Republic of Korea, 1980

households with a female head or spouse ages 25–29 but contain 93.3 percent of the children. The ratio of the two values is 1.034, which means that intact households have 3.4 percent more than their share of sons of a household head. This value, designated *k*, is held constant throughout the projections. The pattern of *k* shown in Table 19 is fairly typical. Intact households generally have somewhat more than their share of children, which one would expect of a group with childbearing patterns currently uninterrupted by divorce, widowhood, or the absence of the spouse for some other reason. Single male heads have well below their share of children because when husband and wife are living apart, children are more likely to live with the mother. Conversely, single female heads typically have close to their *pro rata* share of children despite the interrupted state of their marriage.

Number of grandchildren

Among those in the population under age 15 who are not designated children of a household head, the great majority are grandchildren of a head. Among girls under age 5, between 8 and 22 percent are grandchildren of a household head (Table 20). The likelihood of being a grandchild of a household head declines rapidly with age. No more than 11 percent of those ages 5–9 and no more than 7 percent of those ages 10–14 are grandchildren of a household head. This decline is most often associated with the establishment of separate households by the grandchild's parents, but in some cases it is associated with a shift in the headship designation from the child's grandparents to the child's parents, entailing no change in the composition of the household.

The information used to estimate the number of surviving offspring who are candidates to be children of a head can be readily applied to estimate the number who are candidates to be grandchildren of a head. Projec-

Table 20. Proportion of girls under age 15 who are grandchildren of a household head: Six Asian countries, 1970–1980

	Age group		
Country (year)	0–4	5–9	10–14
Indonesia (1976)	.11	.06	.05
Republic of Korea (1970)	.10	.06	.04
Republic of Korea (1980)	.11	.06	.04
Malaysia (1980)	.17	.11	.07
Philippines (1975)	.08	.05	.03
Taiwan (1980)	.13	.05	.02
Thailand (1970)	.15	.09	.05
Thailand (1980)	.22	.11	.07

tions of the number of children of a household head yield the number of daughters at each childrearing age. Estimates of the candidates for grandchild status are obtained by applying surviving offspring per mother ratios. If childbearing rates for daughters of household heads are identical to childbearing rates for women in general the calculated values will be equal to the number of surviving grandchildren of heads residing in or out of the household. The ratio of the observed number of grandchildren to the calculated "expected" number in the base year constitutes the rates used to project the number of grandchildren.

Table 21 shows an application of the procedure to Korean data. The grandchild ratio varies around 1 depending on the age of the household head's wife and the type of household. A value of 1 is observed when daughters of heads have fertility rates identical to women in general and all of their children live with them. The substantial variation in the grandchild rates is primarily a consequence of differences in fertility between daughters of heads and women who have established separate households. This is particularly evident among households with young heads. Their daughters of childbearing age are themselves young—at an age at which there is considerable variation in children ever born. Because childbearing is associated with the establishment of separate households, women who remain in their primary household will have lower fertility than those who do not. Thus, the number of observed grandchildren will be considerably fewer than the "expected." The women residing in households with older heads are at an age at which there is relatively little variation in children ever born. Most of these women have started their childbearing but remain at home; few have not yet begun to build their families. Thus, the number

Table 21. Illustration of methodology for calculating the number of grandchildren of household heads: Republic of Korea, 1980

Age of principal female	Household type								
	Intact			Male head			Female head		
	Actual	Expected	Ratio	Actual	Expected	Ratio	Actual	Expected	Ratio
40–44	4,170	19,798	.211	835	1,233	0.677	208	3,311	0.063
45–49	25,449	53,794	.473	2,457	2,891	0.850	4,822	10,713	0.450
50–54	49,399	62,387	.792	4,109	3,853	1.066	9,457	17,092	0.553
55–59	48,373	48,374	1.000	4,902	4,055	1.209	11,357	16,401	0.692
60–64	28,602	26,396	1.084	3,200	2,923	1.266	8,301	9,864	0.841
65–69	13,208	10,895	1.212	2,296	1,792	1.281	5.567	5,076	1.097
70–74	4,310	2,952	1.460	1,013	760	1.333	1.927	1,614	1.194

Note: Based on 1980 census data on grandsons of ages 0–4, Republic of Korea.

Table 16. Proportion of women over age 15 who are spouses of a household head, by age group: Six Asian countries, 1970–1980

	Age group												
Country (year)	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55-59	60–64	65–69	70–74	75+
Indonesia (1976)	.15	.53	.76	.83	.82	.76	.68	.58	.44	.29	.23	.15	.08
Republic of Korea (1970)	.02	.30	.72	.83	.82	.79	.72	.61	.49	.35	.22	.12	.05
Republic of Korea (1980)	.01	.23	.70	.84	.85	.84	.77	.64	.51	.37	.24	.12	.04
Malaysia (1980)	.04	.27	.56	.70	.75	.79	.71	.62	.50	.37	.26	.16	.06
Philippines (1975)	.08	.37	.63	.78	.83	.82	.79	.73	.67	.56	.46	.31	.15
Taiwan (1980)	.02	.32	.71	.88	.91	.91	.81	.67	.47	.33	.19	.11	.05
Thailand (1970)	.08	.34	.59	.74	.78	.79	.75	.66	.56	.45	.34	.20	.09
Thailand (1980)	.05	.32	.56	.69	.75	.78	.75	.69	.61	.48	.35	.24	.12

Table 19. Illustration of methodology for projecting offspring of a household head (sons of ages 0–4): Malay heads, Malaysia, 1980

		Age of mother							
Item	Total	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54
Number of sons of head observed living in household[a]									
Intact	340,397	7,453	65,834	105,175	76,138	49,308	28,440	6,499	1,550
Single female head	22,803	120	4,260	6,540	5,820	3,063	2,160	780	60
Single male head[b]	4,056	119	629	1,042	853	540	465	267	142
Total	367,256	7,692	70,723	112,757	82,811	52,911	31,065	7,546	1,752
Number of surviving sons									
Offspring weights[c]	1.000	0.019	0.204	0.309	0.229	0.145	0.075	0.017	0.002
Surviving males, 0–4[d]	449,190	8,669	91,500	138,934	102,640	65,312	33,779	7,636	898
r2[e]	0.817595	0.859693	0.719497	0.757011	0.741797	0.754958	0.841941	0.851074	1.725327
Number of households[a]									
Intact	788,451	18,245	101,358	159,014	141,365	117,932	110,958	77,750	61,829
Single female head	85,740	180	3,240	11,280	12,300	12,720	12,720	17,040	16,260
Single male head[b]	46,182	7,466	11,221	5,896	4,748	5,227	4,448	3,984	3,194
Total	920,373	25,891	115,819	176,190	158,413	135,879	128,126	98,774	81,283
Distribution of sons of head by household type[f]									
Intact	0.927	0.969	0.931	0.933	0.919	0.932	0.915	0.861	0.885
Single female head	0.062	0.016	0.060	0.058	0.070	0.058	0.070	0.103	0.034
Single male head	0.011	0.015	0.009	0.009	0.010	0.010	0.015	0.035	0.081
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Distribution of households by household type[g]									
Intact	0.857	0.705	0.875	0.903	0.892	0.868	0.866	0.787	0.761
Single female head	0.093	0.007	0.028	0.064	0.078	0.094	0.099	0.173	0.200
Single male head	0.050	0.288	0.097	0.033	0.030	0.038	0.035	0.040	0.039
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
k values[h]									
Intact	1.082	1.375	1.064	1.034	1.030	1.074	1.057	1.094	1.163
Single female head	0.667	2.244	2.153	0.906	0.905	0.618	0.700	0.599	0.171
Single male head	0.220	0.053	0.092	0.276	0.344	0.266	0.431	0.876	2.063

a. Tabulated from 1980 Census sample.

b. Distributed by absent spouse's age using distribution for intact households.

c. Offspring weights based on age distribution of births.

d. Total from census tabulation; other values obtained by applying offspring weights.

e. Ratio of sons of head to surviving males.

f. Calculated using tabulation of number of sons.

g. Calculated using tabulation of number of households.

h. Ratio of distribution of sons to distribution of heads.

of observed grandchildren will be much closer to the "expected" number and may be higher if fertility is higher in extended households.

In addition to these selectivity effects, childbearing by women living in three-generation households may differ systematically from that by women who do not. Members of such households may be more traditional in their outlook and have different socioeconomic characteristics. Moreover, extended families may encourage high fertility by reducing the opportunity costs of childbearing. In addition, childbearing by daughters of household heads may be positively associated with the age of their parents to the extent that they are more traditional in their outlook and have imparted their childbearing views to their daughters. Thus, it is not particularly surprising that the observed number of grandchildren exceeds the expected number in households with older heads.

Number of parents

The likelihood that an older woman will be the mother of a household head varies greatly among the countries studied (Table 22). In Indonesia and Thailand in 1970, the proportion of women who are mothers of a household head does not exceed 30 percent in any five-year age group. In Taiwan and Korea, on the other hand, three-fourths or more of all women over age 75 are mothers of a household head.

Candidates for membership of households as a parent of a head consist of members of cohorts who have surviving offspring old enough to be household heads or wives of household heads. The population at risk, consisting of mothers, fathers, mothers-in-law, and fathers-in-law, is quantified as the average number of parents who would reside with their offspring if all parents lived with their children. For example, suppose that a household head had two surviving parents and four surviving siblings; the sur-

Table 22. Proportion of women over age 39 who are mothers of a household head: Six Asian countries 1970-1980

	Age group							
Country (year)	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
Indonesia (1976)	.02	.04	.07	.12	.18	.22	.25	.30
Republic of Korea (1970)	.03	.09	.21	.36	.50	.64	.73	.73
Republic of Korea (1980)	.01	.03	.11	.23	.39	.55	.68	.82
Malaysia (1980)	.01	.03	.09	.15	.24	.36	.43	.53
Philippines (1975)	.01	.01	.04	.06	.12	.17	.26	.36
Taiwan (1980)	.04	.14	.29	.48	.62	.73	.76	.75
Thailand (1970)	.00	.01	.03	.06	.11	.15	.21	.28
Thailand (1980)	.01	.02	.05	.09	.17	.26	.36	.47

viving parents per offspring for this household would be 2 parents/5 offspring = 0.4. If, in addition, the head had a spouse with one surviving parent and one surviving sibling, surviving parents-in-law would be 1 parent/2 siblings = 0.5. The total value, 0.9, would be the expected number of parents if all parents lived with their offspring. For intact households, parents per offspring includes both parents and parents-in-law; for households headed by single persons, however, the supply of potential parents includes only the parents of the head and not parents of the absent spouse.

To calculate rates required for projections, the HOMES model combines estimates of available parents with census data on the number of parents who were, in the base year, residing in households headed by their offspring. Illustrative data for Malaysia are reported in Table 23.

The Malaysian pattern is similiar to that observed elsewhere; the likelihood of co-residence increases rapidly with the age of the mother. Women who are ages 50–54 are much less likely to be the mother of a household head (and much more likely to be the spouse of a head) than women who are ages 70–74. Because the reported mothers of household heads include the mother of either the head or the spouse, a likelihood of two would be consistent with all women in a particular age group being the mother of a head. A value in excess of two is possible if mothers are more likely to reside with members of one age group rather than with members of another or if mothers are more likely to live with children who head households than with children who do not.

In the absence of behavioral changes governing household structure, many developing countries, particularly those far along in their demographic transitions, will experience an increase in the average number of parents per household. The Republic of Korea, for example, will experience

Table 23. Potential and actual mothers per offspring and the likelihood of co-residence: Malaysia, 1980

Age of mother	Mothers per offspring	Total surviving mothers	Reported mothers of head	Likelihood of co-residence
50–54	0.0503	8,203	1,673	0.204
55–59	0.0526	8,578	2,328	0.271
60–64	0.0365	5,952	2,685	0.451
65–69	0.0147	2,397	2,387	0.996
70–74	0.0064	1,044	1,433	1.373
75–79	0.0009	146	418	2.848

Note: Total surviving mothers calculated as product of mothers per offspring and number of households with Malay head and spouse of ages 30–34. In 1980, the census sample reported 163,080 households with the required characteristics.

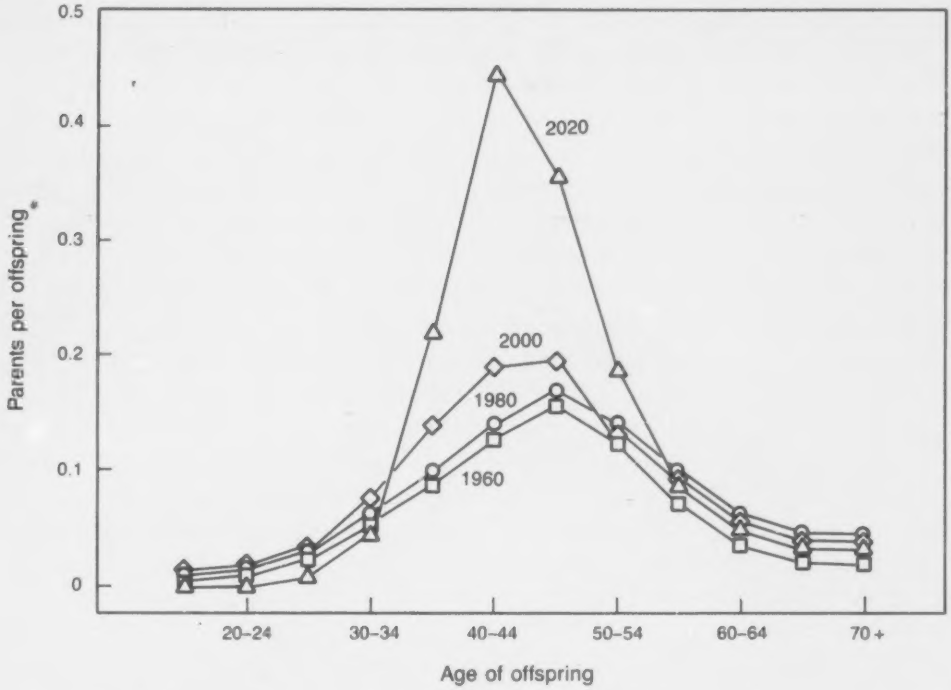

Figure 7. Actual and projected number of surviving parents ages 65 and older per surviving offspring, by age of offspring: Republic of Korea, 1960-2020

a substantial increase in the number of surviving parents per offspring. Figure 7 shows data on number of surviving parents ages 65 and older per offspring in 1960, 1980, and projected to 2000 and 2020. The shift between 1960 and 1980 is small, because, although mortality rates decreased substantially over the period, the probability of parents and of offspring surviving both increased so that there was a small net change in the ratio. The major increases are projected to occur after 1980. Elderly parents per offspring will increase by 15 to 40 percent by the year 2000 among offspring ages 30-49. The increase after 2000 is quite extraordinary. By the year 2020 elderly parents per offspring are projected to triple for offspring ages 40-44 and to double for offspring ages 45-49. The principal cause of the increase in parents per offspring is declining fertility. Surviving offspring will have far fewer surviving siblings with whom to share the responsibility of parental support. There is also some concentration of parents per offspring values within a narrower age range. Again, this reflects a concentration of fertility among women at prime childbearing ages.

Number of other household members

The "others" category includes all household members who are not otherwise included. Because the group is a catch-all, its size and composition varies from country to country. In the Republic of Korea, for example, about 5 percent of the civilian population falls into this category. Of these, one-third are not related to the household head. Of the two-thirds who are related, nearly nine in ten are the head's siblings. Other members tend to be concentrated in households headed by men and women in their 20s and 30s (Table 24). Depending on the type of household, between 75 and 85 percent of all other household members are between the ages of 15 and 30.

HOMES calculates the number of other household members of each age and sex as a residual. The number of individuals of each age who are heads, spouses, children, parents, or grandchildren of the head are totalled and subtracted from the total number of individuals of that age. The number of others of each age and sex are then distributed among households distinguished by type, age of head, and age of spouse in proportion to their occurrence in the base years.

Table 24. Number of other household members per thousand households, by household type: Republic of Korea, 1980

	Household type					
	Intact		Single male head		Single female head	
Age of head	Male	Female	Male	Female	Male	Female
20-24	149	99	719	685	594	742
25-29	158	113	677	644	261	397
30-34	134	101	400	360	122	159
35-39	96	81	237	228	91	109
40-44	71	60	161	164	88	89
45-49	60	55	117	126	82	77
50-54	52	51	125	142	81	63
55-59	42	48	75	92	65	63
60-64	42	48	60	70	86	72
65-69	44	43	62	66	84	85
70+	38	66	83	64	55	70

3 TECHNICAL DESCRIPTION OF THE MODEL

Conventions

All rates used to describe the number and composition of households are calculated from a "base-year" survey or census. These data are differentiated by appending an *S*. For example, *N*1 refers to the projected number of family households and *NS*1 to the corresponding variables from the base-year survey or census.

Whenever practical, variables are indexed as follows. Sex of the household head or member is represented by *s*: 1 denotes males; 2 females; and 3, both sexes combined. Age of a household member is denoted by *a*, age of the principal male (head) by *x*, and age of the principal female (head or spouse of a head) by *w*. In households with no principal female, *w* is the age of the head. Age is measured in five-year age categories, with the upper age bracket, denoted by 18, including all those ages 85 and older. The summation across all age groups is denoted by setting *a*, *x*, or *w* to 19. Year is denoted by *t*.

Upper case letters are reserved for variables representing absolute magnitudes, such as the population or number of heads. Lower case letters are used to represent rates, parameters, and per capita or per household values.

Definition of variables

The variables used in the model are defined as follows.

N(s,a,t) and *NS(s,a)*

the population of sex *s* and age *a* projected to year *t* or from the base-year survey.

Ni(type,s,a,w,t) and *NSi(type,s,a,w)*

the number of household members with relationship to head *i*, of sex *s* and age *a* living in households of type *type* with a principal female (head or spouse of head) aged *w* projected to year *t* (*Ni*) and for the base-year survey (*NSi*). *N*1 and *NS*1 equal the number of households, as well as the number of household heads.

Relationship (i)
1 - Head or spouse
2 - Child of head
3 - Parent of head
4 - Grandchild of head
5 - Other member
T - All relationships combined

Household type (type)
1 - intact, head and wife present
2 - female head, no husband present
3 - male head, no wife present

$N8(s,x,t)$ and $NS8(s,x)$

the number of primary-individual households with a head of sex s and age x, projected to year t and from the base-year survey.

$N5P(sh,s,a,x,t)$ and $NS5P(sh,s,a,x)$

the number of non-head members of sex s and age a residing in primary-individual households with a head of sex sh and age x, projected to year t and from the base-year survey.

$O(s,a,w,t)$ and $OS(s,a,w)$

the number of surviving offspring of sex s, age a, with mothers age w for the population, projected to year t and from the base-year survey.

$ri(type,s,a,w)$

rates of incidence of relationship i occurring among persons of sex s, age a, living in households of type *type* with a principal female age w.

$r8(s,x)$ and $r9(s,x)$

headship rates for one-person households and primary-individual households.

$d(a,w,t)$ and $dr(a,w,t)$

offspring weights, the proportion of the population age a with a mother age w.

$ps(s,z,w,t)$ and $ph(s,z,w,t)$

number of parents of spouse per household and number of parents of head per household, where s and z are the sex and the age of the parents and w is the age of the principal female.

Calculating the number of households

Family households

The number of family households (those consisting of two or more related individuals) $N1$, in which the male householder[3] is age x and the female householder is age w, both in five-year age groups, is calculated as:

$$N1(type,x,w,t) = r1(type,x,w)[b(type)N(1,x,t) + (1\text{-}b(type))N(2,w,t)] \tag{3}$$

$$\begin{aligned} b(1) &= 0.5 \\ b(2) &= 0.0 \\ b(3) &= 1.0 \end{aligned}$$

for $type = 1$ to 3 and x and $w = 1$ to 18. *Type* 1 refers to intact households (those with both husband and wife present). *Type* 2 and *type* 3 refer to female-headed and male-headed households, respectively, in which the head's spouse is not present. The number of households for $x \neq w$ is zero for *type* 2 and *type* 3 households. $N(1,x,t)$ and $N(2,w,t)$ are the male and female populations ages x and w, respectively, in year t. The headship rates, $r1$, are calculated from base-year data as:

$$r1(type,x,w) = NS1(type,x,w)/[b(type)NS(1,x) + (1\text{-}b(type))NS(2,w)] \tag{4}$$

$NS1$ gives the base-year number of households and NS gives the base-year populations.

Non-family households

The number of one-person households, $N9$, and the number of primary-individual households (households consisting of unrelated individuals), $N8$, are calculated by applying time invariant headship rates to year t populations.

$$\begin{aligned} N8(s,x,t) &= r8(s,x)N(s,x,t) \\ N9(s,x,t) &= r9(s,x)N(s,x,t) \end{aligned} \tag{5}$$

for $s = 1$ (male) or 2 (female) and $x = 1$ to 18. The headship rates, $r8$ and $r9$, are calculated from base-year data on population and households.

$$\begin{aligned} r8(s,x) &= NS8(s,x)/NS(s,x) \\ r9(s,x) &= NS9(s,x)/NS(s,x) \end{aligned} \tag{6}$$

Calculating the number of children of a household head

The HOMES model calculates the number of children of a household head as the product of four factors: (1) the number of surviving offspring, O; (2) the likelihood that surviving offspring are children of a household head, $r2$; (3) the prevalence of households of each type; and (4) a variable, k, that quantifies the likelihood that a surviving offspring will be the child of a head in a household of each type. Both k and $r2$ are time invariant, whereas the number of surviving offspring and the prevalence of each household type vary over time. The number of children is calculated as:

$$\begin{aligned} N2(type,s,a,w,t) = {} & O(s,a,w,t)\ r2(4,s,a,w)\ k(type,s,a,w) \\ & \{N1(type,19,w,t)/[N1(1,19,w,t) + N1(2,19,w,t) + N1(3,19,w,t)]\} \end{aligned} \tag{7}$$

where a is the age of the child and w is the age of the female householder.

The likelihood that surviving offspring are children of a head is calculated, using the base-year population, as:

$$r2(type,s,a,w) = NS2(type,s,a,w)/OS(s,a,w) \tag{8}$$

for *type* = 1 to 4, *sex* = 1 or 2, and *a* and *w* = 1 to 18, where *type* 4 is the summation across *type* 1 to *type* 3. *NS*2 and *OS* are the children of the head and the surviving offspring, respectively.

The factor *k* captures the usually observed tendency for children from nonintact households to reside with their mothers rather than with their fathers. Thus, for *type* 2 households, *k* is generally greater than 1 and for *type* 3 households generally less than 1. The factor is calculated by:

$$\begin{aligned} k(type,s,a,w) = {} & [r2(type,s,a,w)/r2(4,s,a,w)]/ \\ & \{NS1(type,19,w)/[NS1(1,19,w)+NS1(2,19,w)+NS1(3,19,w)]\}. \end{aligned} \tag{9}$$

The number of surviving offspring in the base year and in projection years is calculated as:

$$\begin{aligned} OS(s,a,w) &= drs(a,w)\ NS(s,a) \\ O(s,a,w,t) &= dr(a,w,t)\ N(s,a,t) \end{aligned} \tag{10}$$

where *dr* (*drs* for the base year) gives the proportion of all surviving offspring age *a* who have mothers (or fathers for *type* 3 households) age *w*. For a detailed discussion of the methodology used to estimate *dr*, see the section on offspring weights below.

Calculating the number of grandchildren of a household head

The number of grandchildren varies with the number of women of childrearing age who are the daughters of a household head and with their childbearing behavior. The number of grandchildren is calculated by:

$$N4(type,s,a,w,t) = r4(type,s,a,w)\ NE4(type,s,a,w,t) \tag{11}$$

where *NE*4 would be the expected number of grandchildren if all grandchildren lived with their mothers and if childbearing and co-residence patterns of daughters of heads were identical to those of all women of the same age. The expected number of grandchildren is equal to:

$$\begin{aligned} NE4(type,s,a,w,t) = \sum_{x=1}^{18} \{ & N2(type,2,x,w,t)\ [O(s,a,x,t)/N(2,x,t)] \\ & r2(4,s,a,x)\}. \end{aligned} \tag{12}$$

The grandchild rate of incidence varies from 1.0 as the childbearing and co-residence patterns of daughters of household heads differ from those of women in general. The rate is calculated from base-year data as:

$$r4(type,s,a,w) = NS4(type,s,a,w)/NSE4(type,s,a,w) \tag{13}$$

where the expected number of grandchildren in the base-year is calculated with base-year data substituted into equation (12).

Calculating the number of parents of a househead head

The number of parents of a household head varies with the availability of parents:

$$\begin{aligned} N3(type,2,z,w,t) &= r3(type,2,z,w)\ N1(type,19,w,t) \\ &\quad [k4(type)\ ps(2,z,w,t) + k5(type)\ ph(2,z,w,t)] \\ N3(type,1,z,w,t) &= r3(type,1,z,w)\ N1(type,19,w,t) \\ &\quad [k4(type)\ ps(1,z,w,t) + k5(type)\ ph(1,z,w,t)] \end{aligned} \tag{14}$$

where *ps(2,z,w,t)* and *ph(2,z,w,t)* are the per household surviving mothers and mothers-in-law age *z* of spouses age *w* in year *t*, and *ps(1,z,w,t)* and *ph(1,z,w,t)* are the surviving fathers and fathers-in-law. The dummy variables *k*4 and *k*5 vary by household type, excluding parents of absent spouses in *type* 2 and *type* 3 households. The values are:

Type	*k*4	*k*5
1	1	1
2	1	0
3	1	0

The supply of mothers and fathers varies with the number of surviving mothers but also with the number of surviving siblings because potential responsibility for parents is shared among surviving offspring. Mothers of the principal female (head for *type* 3) per household is calculated as:

$$ps(2,z,w,t) = d(w,z,t)\ N(2,z,t) / \sum_{x=1}^{18} d(x,z,t)\ [N(1,x,t) + N(2,x,t)] \tag{15}$$

Mothers of the household head per household for intact households is given by:

$$ph(2,z,w,t) = \sum_{x=1}^{18} [N1(1,x,w,t)/N1(1,x,19,t)]\ ps(2,z,x,t) \tag{16}$$

Fathers of the principal female (head for *type* 3) per household is calculated as:

$$\begin{aligned} ps(1,z,w,t) = \sum_{y=1}^{18} \{ & ps(2,y,w,t)\ [N1(1,z,y,t)/N1(1,z,19,t)] \\ & [N(1,z,t)/N(2,y,t)]\} \end{aligned} \tag{17}$$

Fathers of the household head per household for intact households is calculated as:

$$ph(1,z,w,t) = \sum_{x=1}^{18} [N1(1,s,x,w,t)/N1(1,s,x,19,t)]\ ps(1,z,x,t) \qquad (18)$$

The average rate of incidence, calculated from base-year data, approaches 1.0 to the extent that parents universally live with their offspring. The value may exceed 1.0 for particular groups of households to the extent that there is differential selection by parents. The rate of incidence for mothers is calculated from base-year data by:

$$\begin{aligned} r3(type,2,z,w) = {} & [NS3(type,2,z,w)/NS1(type,19,w)]/ \\ & [k4(type)\ pss(2,z,w) + k5(type)\ phs(2,z,w)] \end{aligned} \qquad (19)$$

and the rate of incidence for fathers by:

$$\begin{aligned} r3(type,1,z,w) = {} & [NS3(type,1,z,w)/NS1(type,19,w)]/ \\ & [k4(type)\ pss(1,z,w) + k5(type)\ phs(1,z,w)] \end{aligned} \qquad (20)$$

where *pss* and *phs* are calculated by substituting base-year data into equations (15) to (18).

Calculating the number of other household members

The HOMES model calculates the total number of other household members in each age and sex group as the residual of individuals not otherwise allocated to household membership. The residual is distributed among family households and primary-individual households in proportion to the observed distribution per household in the base year and to the projected number of households of each type. Other members are calculated as:

$$\begin{aligned} N5(type,s,a,w,t) &= k6(s,a,t)\ r5(type,s,a,w)\ N1(type,19,w,t) \\ N5P(sh,s,a,x,t) &= k6(s,a,t)\ r5p(sh,s,a,x)\ N8(sh,x,t) \end{aligned} \qquad (21)$$

where $N5P(sh,s,a,x,t)$ is the number of other members of sex s and age a residing in year t in primary-individual households with heads of sex sh and age x. The term, $k6$, is calculated to ensure that all residual members are distributed. The rates of incidence are calculated from base-year data as:

$$\begin{aligned} r5(type,s,a,w) &= NS5(type,s,a,w)/NS1(type,19,w) \\ r5p(sh,s,a,x) &= NS5P(sh,s,a,x)/NS8(sh,x) \end{aligned} \qquad (22)$$

Calculating offspring weights

Offspring weights $(d(a,w,t))$ are calculated using procedures first described by Mason and Martin (1982). The number of surviving offspring age a of women age w in year t is equal to:

$$O(3,a,w,t) = p(a,t)\ B(w-a,t-a) \qquad (23)$$

where $p(a,t)$ is the probability of surviving from birth to age a in year t and $B(w\text{-}a,t\text{-}a)$ is the total number of births to women age $w\text{-}a$ in year $t\text{-}a$. The total number of surviving offspring at age a in year t, equal to the population age a in year t, is found by summing across w:

$$N(a,t) = p(a,t) \sum_w B(w\text{-}a,t\text{-}a) \tag{24}$$

Dividing equation (23) by equation (24) yields the offspring weights:

$$d(a,w,t) = [O(3,a,w,t)/N(a,t)] = B(w\text{-}a,t\text{-}a) \;/\; \sum_w B(w\text{-}a,t\text{-}a) \tag{25}$$

Offspring weights for any cohort are equal to the age distribution of births in the year of the cohort's birth. The number of surviving offspring, O, is calculated as the product of the offspring weights and the current population of the cohort. The same weights apply to male and female offspring.

The model estimates the number of births to each cohort of women from information on age-specific fertility rates, f, and the number of women belonging to the cohort. A crude approximation could be obtained by using a simple average, setting k to 2.5 in:

$$\begin{aligned} B(w\text{-}a,t\text{-}a) = {} & [5\text{-}k(a\text{-}1,t\text{-}1)]\, f(w\text{-}a\text{-}1,t\text{-}a\text{-}1)\, N(2,w\text{-}a\text{-}1,t\text{-}a\text{-}1) \\ & + k(a,t)\, f(w\text{-}a,t\text{-}a)\, N(2,w\text{-}a,t\text{-}a) \end{aligned} \tag{26}$$

This, however, yields an inadequate estimate because age-specific fertility rates vary so substantially within age categories. The fertility exposure of a cohort of women uniformally distributed from ages 15 to 19 is, over the following five years, concentrated at ages 19 and 20 (36 percent of the total exposure) and very limited at the extreme ages of 15 and 24 (4 percent of the total exposure.) This problem is circumvented by allowing k to vary with the pattern of fertility, accounting for the within-age-group variation by adding to the equation the age-specific fertility rates for adjacent five-year age groups and the mean age of childbearing.

The values of k were estimated using data from Coale and Trussel's model fertility schedules:

$$\begin{aligned} k(3,t) &= 0.0 \\ k(4,t) &= 0.87913 + 1.7969\, R(4,t) \\ k(5,t) &= -0.75512 + 1.1605\, R(5,t) + 0.069187\, M(t) \\ k(6,t) &= 3.5797 + 0.049133\, R(6,t) - 0.037807\, M(t) \\ k(7,t) &= 2.3736 + 0.16486\, R(7,t) \\ k(8,t) &= 2.4459 + 0.10441\, R(8,t) \\ k(9,t) &= 2.8262 + 0.093475\, R(8,t) \\ k(10,t) &= 3.4582 + 0.010980\, R(9,t) \text{ if } R(9,t) \text{ is defined} \\ &= 0 \text{ if } R(9,t) \text{ is not defined} \end{aligned} \tag{27}$$

where $R(a) = f(a,t)/f(a+1,t)$ is the ratio of the fertility rates of adjacent age groups and M is the mean age of childbearing. The births to women age w in year t is approximated by substituting for k in equation (26).

Adjusting offspring weights

Offspring weights must be adjusted to allow for the fact that some offspring live only with their fathers in *type* 3 households. To calculate the number of children of a head the model uses a weighted average of $d(a,w,t)$ and offspring weights specific to the age of husbands $dh(a,w,t)$:

$$dr(a,w,t) = wt(w,t)d(a,w,t) + (1-wt(w,t))dh(a,w,t) \tag{28}$$

where the weight is the proportion of households with the principal female present. The revised weights are normalized to sum to 1.0.

Offspring weights for fathers must be approximated using a crude procedure because fertility rates specific to the father's age are not generally available. Hence, dh is calculated by assuming that fertility is independent of the father's age (given the age of his wife) so that dh can be calculated as a weighted average of the corresponding values of d by:

$$dh(a,w,t) = d(a,z,t)\cdot N1(1,w,z)/N1(1,w,19) \tag{29}$$

where the dh weights are normalized so that they sum (across w) to total 1.

Reliability of procedures

The procedures are designed to reproduce household characteristics of a population in a census or survey year. For several reasons, however, calculated values for the base year do not exactly reproduce census values. First, rates based on a sample are subject to sampling variance. Second, in most cases census editing procedures do not apply consistency checks to data on the relationship of household members to household head. Thus, tabulations include, for example, children of a head who are older than either the head or the spouse. The HOMES model essentially edits out such cases as part of the calculation process and includes them as "other" household members. Third, census data are subject to underenumeration and age-misreporting; no acceptable procedures have been established for adjusting the number of households and household members. The HOMES model calculates adjusted estimates by applying headship and membership rates to adjusted population data. This procedure is appropriate to the extent that age misreporting and underenumeration of individuals are independent of the relationship of a household member to the household head.

4 RUNNING HOMES

HOMES can be conceptualized as consisting of two components or stages. In stage 1 the rules governing household formation and composition are determined from base-year data. In stage 2 the number and composition of households are projected by applying the rules determined in stage 1 to projected population data. Stages 1 and 2 are generally run separately. Stage 2 may be run repeatedly to obtain alternative household projections based on alternative projections of the population. Stage 1, in contrast, will be run only rarely—generally after a census or major national survey.

This section includes instructions for setting up the data input for stage 1 and stage 2. The current release of HOMES includes stage 1 output from a recent census, so that the user is not required to run stage 1. Documentation for stage 1 is provided mainly for informational purposes; the user is not required to prepare any of the stage 1 input files. Instructions for converting HOMES data files into SAS files and two programs for generating summary tables are also provided. These programs were used to create most of the tables presented in section 1 of this reference guide. These programs can be used only on systems that support SAS including PROC MATRIX routines. Summaries of HOMES programs are provided in Appendix B.

Data input for stage 1: Rate calculations

Data input for stage 1 is contained in four files. The first file, country.HW.DATA, contains data on the base-year population and on household heads. The second file, country.MEM.DATA, contains data on household members, and the third file, country.IGW.DATA, contains base-year intergenerational weights. The fourth file, country.CIV.DATA, contains data on the proportions of the total population that are institutionalized or in the military and that are therefore excluded from the household population.

Population data for lines 1 and 2 of the country.HW.DATA input file (Exhibit A) are generally available from published statistical reports. If possible, data should be adjusted for age-misreporting and underenumeration. The survey population data in lines 3 and 4 come from the census or survey tabulations and should include only the civilian, non-institutionalized population. Lines 5 through 29 are tabulated from the census or survey. Data are formatted 19F10.0 (right justified within ten-column blocks).

Data for input file country.MEM.DATA (Exhibit B) are obtained by tabulation from survey or census sample. Exact definitions of relationship categories may vary from country to country. Children and grandchildren should, however, include adopted children, children-in-law, and stepchildren; parents should include parents of either the head or the spouse as well as stepparents. "Others" is a residual category that must include all

Exhibit A. Input file: country.HW.DATA

Line no.		0-4	5-9	10-14	. . . .	85+	Total
	N(s,x)—Total population for base year (format: 19F10.0)						
1	Males						
2	Females						
	NS(s,x)—Survey population						
3	Males						
4	Females						
	NS1(type,x,w)—Number of households						
	Type 1 ◄——— Age of spouse (w) ———►						
	Males						
	Age of Husband (x)						
5	0-4						
6	5-9						
.	.						
.	.						
22	85+						
23	Total						
24	*Type* 2 ◄—Age of head (w for *Type* 2, x for *Type* 3)—►						
25	*Type* 3						
	NS8(s,x)—Primary-individual households						
26	Males						
27	Females						
	NS9(s,x)—One-person households						
28	Males						
29	Females						

household members, including employees and other unrelated members, not otherwise classified. Data are formatted 19F10.0 (right justified within ten-column blocks).

Base-year weights used in the country.IGW.DATA file (Exhibit C) are calculated in accordance with the technical description, equations (25), (26), and (27), using historical times series of age-specific fertility rates and population. Base-year weights are available for the Asian countries referred to in Section 2 and for all OECD countries.

The proportions in country.CIV.DATA (Exhibit D) must be calculated based on independent data sometimes available in census publications. Lines 1 and 2 are the proportions of the total population in the military and not the household population. Lines 3 and 4 are the proportions of

Exhibit B. Input file: country.MEM.DATA

	Age of	Age of spouse or head					
Line no.	member	0-4	5-9	10-14	. . . .	85+	Total
	NS2(type,s,a,w)—Number of children (format: 19F10.0)						
	Type 1						
	Males						
1	0-4						
2	5-9						
.	.						
.	.						
18	85+						
19	Total						
20-38	Females						
	Type 2						
39-57	Males						
58-76	Females						
	Type 3						
77-95	Males						
96-114	Females						
	NS3(type,s,a,w)—Number of parents of head						
	Type 1						
115-133	Males						
134-152	Females						
	Type 2						
153-171	Males						
172-190	Females						
	Type 3						
191-209	Males						
210-228	Females						
	NS4(type,s,a,w)—Number of grandchildren of head						
	Type 1						
229-247	Males						
248-266	Females						
	Type 2						
267-285	Males						
286-304	Females						
	Type 3						
305-323	Males						
324-342	Females						

Exhibit B. Input file: country.MEM.DATA (*continued*)

Line no.	Age of member	Age of spouse or head					Total
		0–4	5–9	10–14	. . . .	85+	
	NS5(type,s,a,w)—Number of other members						
	Type 1						
343–361	Males						
362–380	Females						
	Type 2						
381–399	Males						
400–418	Females						
	Type 3						
419–437	Males						
438–456	Females						
	NS5P(sh,s,a,w)—Number of other members, P.I. HH's						
	Male heads						
457–475	Males						
476–494	Females						
	Female heads						
495–513	Males						
514–532	Females						

Note: For *type* 3 households, data are *NSiH(type,s,a,x)* (members are distributed by age of father).

Exhibit C. Input file: country.IGW.DATA

Line no.	Age of offspring	Age of mother					Total
		0–4	5–9	10–14	. . . .	85+	
		d(a,w)—Intergenerational weights					
1	0–4	(format: 8F10.4/8F10.4/3F10.4)					
2	5–9						
.	.						
.	.						
18	85+						
19	Total						

Exhibit D. Input file: country.CIV.DATA

Line no.		0–4	5–9	10–14	. . . .	85+	Total
	RMN(s,x)—Proportion of total population in military						
1	Males			(format: 19F10.5)			
2	Females						
	RIN(s,x)—Proportion of civilian population institutionalized						
3	Males						
4	Females						

the civilian population living in institutions. If only combined data are available, lines 1 and 2 can be the proportions of the total population excluded from the household population because of military service or institutionalization. Lines 3 and 4 are then set to zero. If this procedure is followed, the projected institutionalized population will be included with the military population. The data format is 19F10.5, (right justified within ten-column blocks) with provision for five decimal places.

Data input for stage 2: Household projections

Data input for stage 2 includes headship and relationship to head rates calculated from stage 1, base-year intergenerational weights, and proportions of military and institutionalized populations, all of which are generally provided as part of the projection package. Most users will create files containing only the projected population data and age-specific fertility rates, as specified below.

The first line of input file country.POP.DATA (Exhibit E) contains *startyr,* the year for population data contained in lines 2 and 3, and *endyr,* the year for population contained in the last lines. Data must be entered beginning in the first column as four digits (for example, 1950) followed by a one-column space and four digits. Population data are entered in eighteen ten-column blocks right justified within each block (formatted as 18f10.0).

The projection period is not determined by *startyr* and *endyr.* It may begin after *startyr* and terminate before *endyr.* Thus, the population file and the fertility file can contain data for non-projection years. HOMES can also project backwards; that is, it can calculate for years before the base year so that *startyr* may be less than the base year.

In input file country.FERT.DATA (Exhibit F), fertility rates are births per year per 1,000 women in each age group. Data input provides for two decimal places, and data must be entered formatted 7F10.2 (right justified within 10 ten-column blocks) with two digits to the right of the decimal point.

Exhibit E. Input file: country.POP.DATA

Line no.	Year & sex	Age				
		0–4	5–9	10–14	. . . .	85+
1	*Startyr Endyr* 'comment if any' (format: I4, I5)					
	N(s,x)—Population in five-year age groups (format: 18F10.0)					
	Startyr					
2	Male					
3	Female					
	Startyr+5					
4	Male					
5	Female					
.	.					
.	.					
	Endyr					
.	Male					
.	Female					

Exhibit F. Input file: country.FERT.DATA

Line no.	Year	Age			
		15–19	20–24	. . .	45–49
1	*Startyr Endyr* 'comment if any' (format: I4, I5)				
	f(a,t)—age-specific fertility rates (format: 7F10.2)				
2	*Startyr*				
3	*Startyr+5*				
.	.				
.	.				
.	*Endyr*				

5 DESCRIPTION OF OUTPUT

For males and females tabulated in five-year age groups, HOMES determines the relationship to the head of household, the type of household in which the individuals reside, and the age (in five-year intervals) of the head or spouse of the household in which the members reside at five-year

Exhibit G. Table of contents for HOMES output

Output pages	Description
99–101	Population in five-year age groups by sex; civilian, noninstitutional; military; institutional.
102–104	Number of intact and single-headed households by age and sex of head.
105–106	Number of primary-individual and one-person households by sex and age of head.
107	Number of intact households by age of head and age of spouse.
108–113	Number of children in intact and single-headed households by age and sex of children and age of principal female (head, if female; spouse of head, otherwise).
114–119	Number of parents in intact and single-headed households by age and sex of parents and age of principal female (head, if female; spouse of head, otherwise).
120–125	Number of grandchildren in intact and single-headed households by age and sex of grandchildren and age of principal female (head, if female; spouse of head, otherwise).
126–135	Number of other members in intact, single-headed, and primary-individual households by age and sex of other members and age of principal female (head, if female; spouse of head, otherwise).
136–145	Total number of members in intact, single-headed, and primary-individual households by age and sex of members and age of head (single-headed and primary individual-households) or spouse (intact households).
146–147	Total number of members in all households combined by age and sex of members and age of wife or head.

Note: Output page numbers begin with 99 because 1990 projection is reported and base year for run is 1980.

time intervals. The table of contents for the HOMES output (Exhibit G) and an example of the printed output is provided in this section. These data are also written to computer files to facilitate further analysis and the preparation of summary tables and measures.

The three output files for the HOMES model (Exhibit H) contain data on household head (country.N1.DATA); children, parents, grandchildren, and other household members (country.N2.DATA); and total household members (country.NT.DATA). The data are written to files in the same order as they are printed, using 19 columns and the format 19F10.0.

Exhibit H. Output files for HOMES

File name	Description of contents (row numbers)
country.N1.DATA:	Number of intact households (1)
	Number of single-headed households (2-3)
	Number of spouses of head, *Type* 1 households (4-22)
	Number of primary-individual households (23-24)
	Number of one-person households (25-26)
country.N2.DATA:	Number of children, males and females
	Intact households (1-38)
	Single-headed households, female head (39-76)
	Single-headed households, male head (77-114)
	Number of parents, males and females
	Intact households (115-152)
	Single-headed households, female head (153-190)
	Single-headed households, male head (191-228)
	Number of grandchildren, males and females
	Intact households (229-266)
	Single-headed households, female head (267-304)
	Single-headed households, male head (305-342)
	Number of other members, males and females
	Intact households (343-380)
	Single-headed households, female head (381-418)
	Single-headed households, male head (419-456)
	Primary-individual households, male head (457-494)
	Primary-individual households, female head (495-532)
country.NT.DATA:	Total number of members, males and females
	Intact households (1-38)
	Single-headed households, female head (39-76)
	Single-headed households, male head (77-114)
	Primary-individual households, male head (115-152)
	Primary-individual households, female head (153-190)
	One-person households, male (191)
	One-person households, female (192)

```
                                         TOTAL POPULATION
                                   CIVILIAN, NON-INSTITUTIONAL

                                               MALE


      0-4         5-9       10-14       15-19       20-24       25-29       30-34       35-39       40-44

 2280735.    2247203.    2032285.    2214951.    1578904.    2164731.    1976637.    1506582.    1250031.


    45-49       50-54       55-59       60-64       65-69       70-74       75-79       80-84         85+       TOTAL

 1090971.    1014352.     753116.     488421.     364073.     213613.      95777.      42002.      15818.   21330096.


                                              FEMALE


      0-4         5-9       10-14       15-19       20-24       25-29       30-34       35-39       40-44

 2115903.    2073413.    1882597.    2019217.    2053120.    2111832.    1960858.    1450033.    1171156.


    45-49       50-54       55-59       60-64       65-69       70-74       75-79       80-84         85+       TOTAL

 1074362.    1025146.     848721.     660207.     525376.     361936.     212988.     119111.      57010.   21722896.
```

```
                                        TOTAL POPULATION
                                            MILITARY

                                              MALE

   0-4       5-9      10-14      15-19      20-24      25-29      30-34      35-39      40-44

    0.        0.       163.     18676.    645848.     97828.     40816.     25421.     15332.

 45-49     50-54      55-59      60-64      65-69      70-74      75-79      80-84        85+       TOTAL

 7867.     3161.      1050.       357.       171.        73.        32.        14.         5.    856816.

                                             FEMALE

   0-4       5-9      10-14      15-19      20-24      25-29      30-34      35-39      40-44

    0.        0.        95.       762.      2412.      1380.      1140.       756.       575.

 45-49     50-54      55-59      60-64      65-69      70-74      75-79      80-84        85+       TOTAL

  463.      380.       128.        99.        68.        44.        26.        16.         7.      8349.
```

```
                                   TOTAL POPULATION
                                    INSTITUTIONAL

                                        MALE

0-4       5-9       10-14     15-19     20-24     25-29     30-34     35-39     40-44
   0.        0.      9371.    46726.    40983.    30113.     7162.     3588.     2819.

45-49     50-54     55-59     60-64     65-69     70-74     75-79     80-84     85+       TOTAL
2987.     2155.      1456.      876.      562.      598.      359.      197.       72.   150422.

                                       FEMALE

0-4       5-9       10-14     15-19     20-24     25-29     30-34     35-39     40-44
   0.        0.     10031.    95855.    59948.     9759.     3831.     2106.     2124.

45-49     50-54     55-59     60-64     65-69     70-74     75-79     80-84     85+       TOTAL
1776.     1756.      1215.     1144.      642.      922.      664.      470.      187.   192429.
```

```
                                              NUMBER OF HEADS
                                             INTACT HOUSEHOLDS
                                                   MALE

                                             - AGE OF HEAD -
     0-4         5-9        10-14        15-19        20-24        25-29        30-34        35-39        40-44

      0.          0.           0.        2558.       94058.      897733.     1530632.     1421148.     1212571.


   45-49       50-54        55-59        60-64        65-69        70-74        75-79        80-84          85+        TOTAL

 966896.     785891.      649340.      433821.      276762.      137783.       46786.       14211.        3718.     8473903.
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```
                                NUMBER OF HEADS
                    SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
                                    FEMALE

                                - AGE OF HEAD -
     0-4        5-9       10-14      15-19      20-24      25-29      30-34      35-39      40-44

      0.         0.         0.      21377.     66553.     64890.     97651.    116677.    128216.


   45-49      50-54      55-59      60-64      65-69      70-74      75-79      80-84        85+      TOTAL

  161937.    186012.    151055.     92646.     57626.     30273.     13471.      5564.      1565.   1195509.
```

NUMBER OF HEADS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE

- AGE OF HEAD -

0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0.	0.	0.	29214.	79728.	114524.	40875.	23352.	25726.

45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
29873.	34826.	32835.	25655.	23925.	17128.	7799.	5378.	2300.	493137.

```
                                   NUMBER OF HEADS
                            PRIMARY INDIVIDUAL HOUSEHOLDS

                                     MALE HEADS

                                  - AGE OF HEAD -
 0-4      5-9       10-14     15-19     20-24     25-29     30-34     35-39     40-44

   0.        0.        0.    22460.    18817.    13358.     2639.     1519.      951.


 45-49    50-54     55-59     60-64     65-69     70-74     75-79     80-84     85+       TOTAL

 936.      818.      459.      351.      395.      236.       94.       37.        0.    63070.


                                    FEMALE HEADS

                                  - AGE OF HEAD -
 0-4      5-9       10-14     15-19     20-24     25-29     30-34     35-39     40-44

   0.        0.        0.    21382.    24206.     7574.     3660.     2182.     1513.


 45-49    50-54     55-59     60-64     65-69     70-74     75-79     80-84     85+       TOTAL

 1544.    1744.     2269.     1893.     1470.      847.      259.      137.      131.    70811.
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                              NUMBER OF HEADS
                           ONE PERSON HOUSEHOLDS

                                MALE HEADS

                              - AGE OF HEAD -
 0-4      5-9      10-14     15-19     20-24     25-29     30-34     35-39     40-44

   0.        0.        0.   20927.    35933.    52610.    18344.     9726.     7909.


45-49    50-54     55-59     60-64     65-69     70-74     75-79     80-84      85+      TOTAL

8745.   11104.     7310.     6804.     4581.     3192.     2232.      738.      341.   190495.


                               FEMALE HEADS

                              - AGE OF HEAD -
 0-4      5-9      10-14     15-19     20-24     25-29     30-34     35-39     40-44

   0.        0.        0.   17097.    47346.    28654.    20582.    14417.    12877.


45-49    50-54     55-59     60-64     65-69     70-74     75-79     80-84      85+      TOTAL

16534.  30905.    40458.    45674.    40386.    25796.    13697.     5334.     2822.   362579.
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                                                NUMBER OF INTACT HOUSEHOLDS
                                                   AGE OF HEAD AND WIFE

 AGE                                                   - AGE OF WIFE -
GROUP        0-4        5-9       10-14       15-19       20-24       25-29       30-34       35-39       40-44

 0- 4         0.         0.          0.          0.          0.          0.          0.          0.          0.
 5- 9         0.         0.          0.          0.          0.          0.          0.          0.          0.
10-14         0.         0.          0.          0.          0.          0.          0.          0.          0.
15-19         0.         0.          0.        759.        671.        181.          0.        223.        214.
20-24         0.         0.          0.      10635.      75589.       6781.        259.        165.        108.
25-29         0.         0.          0.      10525.     393670.     477633.      14476.        673.        125.
30-34         0.         0.          0.       2164.     154603.     863015.     494190.      15704.        503.
35-39         0.         0.          0.        127.      13300.     217052.     784072.     386501.      10944.
40-44         0.         0.          0.         52.       1306.      22525.     231737.     602837.     331427.
45-49         0.         0.          0.        110.        566.       3526.      25463.     159922.     480754.
50-54         0.         0.          0.         62.        587.       1486.       4320.      23121.     149233.
55-59         0.         0.          0.          0.        168.        667.       1632.       7931.      33307.
60-64         0.         0.          0.          0.        269.        719.        522.       2005.       7762.
65-69         0.         0.          0.          0.        174.        394.        281.       1039.       2492.
70-74         0.         0.          0.         59.         51.         59.        148.        553.       1002.
75-79         0.         0.          0.          0.          0.         59.         71.         57.        296.
80-84         0.         0.          0.          0.          0.          0.         65.          0.         53.
85+           0.         0.          0.          0.          0.          0.         62.          0.         48.

TOTAL         0.         0.          0.      24492.     640960.    1594093.    1557293.    1200726.    1026268.

 AGE
GROUP      45-49      50-54       55-59       60-64       65-69       70-74       75-79       80-84         85+       TOTAL

 0- 4         0.         0.          0.          0.          0.          0.          0.          0.          0.          0.
 5- 9         0.         0.          0.          0.          0.          0.          0.          0.          0.          0.
10-14         0.         0.          0.          0.          0.          0.          0.          0.          0.          0.
15-19       165.       290.         56.          0.          0.          0.          0.          0.          0.       2558.
20-24       230.        71.        220.          0.          1.          0.          0.          0.          0.      94058.
25-29       274.        69.        219.          0.          0.          0.         69.          0.          0.     897733.
30-34       301.        75.         78.          0.          0.          0.          0.          0.          0.    1530632.
35-39       816.       122.         73.         67.         72.          0.          0.          0.          0.    1421148.
40-44     21791.       421.        317.         54.         57.          0.         52.          0.          0.    1212571.
45-49    282119.     13725.        517.        194.          0.          0.          0.          0.          0.     966896.
50-54    385701.    209789.      10915.        457.        146.          0.         74.          0.          0.     785891.
55-59    153526.    288945.     150507.      12090.        430.        138.          0.          0.          0.     649340.
60-64     35565.    116354.     168871.      89977.      11180.        597.          0.          0.          0.     633821.
  -69     10194.     33687.      78743.      89717.      53033.       6737.        272.          0.          0.     276752.
   74      2876.     10084.      19587.      37066.      41357.      21968.       2909.         64.          0.     137783.
   79       586.      1324.       4471.       7937.      13464.      11310.       6480.        672.         60.      46786.
    4        56.       355.       1106.       2031.       2197.       3849.       2577.       1857.         64.      14211.
              0.       255.         63.        454.        558.        639.        741.        765.        131.       3718.

   AL    896200.    675567.     435743.     240044.     122494.      45239.      13176.       3358.        255.    8473903.
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1990 KUREA

                                              NUMBER OF CHILDREN
                                              INTACT HOUSEHOLDS
                                                 MALE MEMBERS

 AGF                                                - AGE OF WIFE -
GROUP        J-4         5-9        10-14       15-19       20-24       25-29       30-34       35-39       40-44

 0- 4          0.          0.          0.       5283.     255854.    1013634.     628914.      94187.       2830.
 5- 9          0.          0.          0.         79.      12868.     301542.     994878.     529678.     140277.
10-14          0.          0.          0.        127.        830.      12301.     299591.     750756.     428137.
15-19          C.          0.          0.          0.       1135.       3127.      22100.     212444.     505642.
20-24          0.          0.          0.          0.        980.       1880.       2047.       6221.      87389.
25-29          0.          0.          0.          0.        417.       1885.       1596.       1134.       5404.
30-34          0.          0.          0.          0.        136.        417.        501.        402.        423.
35-39          0.          0.          0.          0.          0.         77.         93.        270.        102.
40-44          0.          0.          0.          0.          0.          3.          2.          7.         11.
45-49          0.          0.          0.          0.          0.         86.          0.         64.         66.
50-54          0.          0.          0.          0.          0.          0.          0.         58.          0.
55-59          0.          0.          0.          0.          0.          0.          0.          0.          0.
60-64          0.          0.          0.          0.          0.          0.          0.          0.          0.
65-69          0.          0.          0.          0.          0.          0.          0.          0.          0.
70-74          0.          0.          0.          0.          0.          0.          0.          0.          0.
75-79          0.          0.          0.          0.          0.          0.          0.          0.          0.
80-84          0.          0.          0.          0.          0.          0.          0.          0.          0.
 85+           0.          0.          0.          0.          0.          0.          0.          0.          0.

TOTAL          0.          0.          0.       5489.     272220.    1334946.    1949716.    1595218.    1170277.


 AGE
GROUP       45-49       50-54       55-59       60-64       65-69       70-74       75-79       80-84        85+         TOTAL

 0- 4        555.        207.        222.        245.         82.         54.          0.          0.          0.     2002061.
 5- 9       4184.       1268.        273.         95.         66.         18.          0.          0.          0.     1985221.
10-14     168733.      56690.      12924.       1072.        545.        164.         81.          0.          0.     1731946.
15-19     435875.     196053.      72095.      12071.       1759.        598.        139.          0.          0.     1463035.
20-24     278132.     234908.     103215.      37471.       7313.        781.        194.          0.          0.      760531.
25-29      82243.     203724.     123195.      54480.      17309.       2379.        228.          0.          0.      493993.
30-34       4775.      49880.      59140.      29338.      12529.       3559.        402.         80.          0.      161581.
35-39        264.       1039.      12844.      12117.       4983.       2249         382.         84.          0.       34504.
40-44          3.         16.         93.        731.        673.        213.         44.          4.          4.        1803.
45-49        238.         63.        187.       1183.       6467.       3233.       1664.          0.          0.       13252.
50-54          0.        110.          0.         61.        712.       3180.       1133.        278.          0.        5531.
55-59          0.          0.        176.         41.          0.        276.       1214.        579.          0.        2286.
60-64          0.          0.          0.          0.          0.          0.        117.        337.         63.         518.
65-69          0.          0.          0.          0.          0.          0.          0.          0.          0.           0.
70-74          0.          0.          0.          0.          0.          0.          0.          0.          0.           0.
75-79          0.          0.          0.          0.          0.          0.          0.          0.          0.           0.
80-84          0.          0.          0.          0.          0.          0.          0.          0.          0.           0.
 85+           0.          0.          0.          0.          0.          0.          0.          0.          0.           0.

TOTAL     975000.     763958.     384365.     148904.      52437.      16703.       5599.       1362.         68.     8656259.
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NUMBER OF CHILDREN
INTACT HOUSEHOLDS
FEMALE MEMBERS

AGF GROUP					- AGE OF WIFE -				
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	4757.	245667.	966105.	567016.	83803.	2666.
5- 9	0.	0.	0.	83.	12175.	283961.	941588.	481947.	128894.
10-14	0.	0.	0.	122.	675.	12523.	274630.	693875.	394696.
15-19	0.	0.	0.	111.	735.	2331.	19119.	186171.	452495.
20-24	0.	0.	0.	0.	329.	875.	1275.	3940.	74922.
25-29	0.	0.	0.	0.	232.	386.	394.	253.	1287.
30-34	0.	0.	0.	0.	151.	160.	78.	262.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	234.	49.
40-44	0.	0.	0.	0.	0.	3.	1.	0.	5.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	69.	0.	0.	0.
65-69	0.	0.	0.	-0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	5073.	259964.	1266408.	1804097.	1450483.	1055013.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	553.	238.	198.	152.	156.	58.	0.	0.	0.	1871364.
5- 9	3710.	1169.	317.	172.	224.	83.	21.	0.	0.	1854337.
10-14	155901.	51921.	12497.	1245.	454.	188.	54.	0.	0.	1598780.
15-19	388373.	179876.	66874.	13296.	1574.	336.	90.	0.	0.	1311378.
20-24	269059.	258259.	109777.	42562.	8442.	862.	103.	0.	0.	770405.
25-29	27994.	108022.	76734.	37479.	14406.	2725.	387.	0.	0.	270300.
30-34	853.	16276.	33456.	23198.	10169.	3965.	474.	247.	0.	89288.
35-39	140.	334.	8103.	15374.	10069.	3695.	772.	68.	0.	38838.
40-44	3.	2.	31.	259.	505.	240.	83.	4.	4.	1140.
45-49	1.	1.	1.	3.	20.	27.	12.	3.	0.	68.
50-54	0.	175.	53.	144.	240.	1146.	1357.	446.	0.	3561.
55-59	0.	0.	165.	0.	0.	53.	756.	486.	0.	1460.
60-64	0.	0.	0.	0.	0.	0.	0.	70.	70.	209.
65-69	0.	0.	0.	0.	0.	0.	0.	144.	0.	144.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	846586.	616273.	308206.	133883.	46261.	13379.	4108.	1467.	73.	7811265.

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                                          NUMBER OF CHILDREN
                                 SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
                                             MALE MEMBERS

 AGE                                                   - AGE OF HEAD -
 GROUP        0-4          5-9         10-14        15-19         20-24        25-29        30-34        35-39        40-44

  0- 4         0.           0.           0.          42.          5371.        27383.       27460.        6246.         258.
  5- 9         0.           0.           0.          38.           266.        14127.       59167.       38763.       12496.
 10-14         0.           0.           0.         212.           235.          827.       21359.       65234.       43575.
 15-19         0.           0.           0.         254.           328.          351.        2179.       23389.       57845.
 20-24         0.           0.           0.           0.            45.          159.          44.         834.       13145.
 25-29         0.           0.           0.           0.             0.          140.          60.          35.         658.
 30-34         0.           0.           0.           0.            63.           83.           0.          68.         139.
 35-39         0.           0.           0.           0.             0.            0.           0.           0.           0.
 40-44         0.           0.           0.           0.             0.            0.           0.           0.           6.
 45-49         0.           0.           0.           0.             0.            0.           0.           0.           0.
 50-54         0.           0.           0.           0.             0.            0.           0.           0.          72.
 55-59         0.           0.           0.           0.             0.            0.           0.           0.           0.
 60-64         0.           0.           0.           0.             0.            0.           0.           0.           0.
 65-69         0.           0.           0.           0.             0.            0.           0.           0.           0.
 70-74         0.           0.           0.           0.             0.            0.           0.           0.           0.
 75-79         0.           0.           0.           0.             0.            0.           0.           0.           0.
 80-84         0.           0.           0.           0.             0.            0.           0.           0.           0.
  85+          0.           0.           0.           0.             0.            0.           0.           0.           0.

 TOTAL         0.           0.           0.         545.          6308.        43069.      110268.      134569.      128193.


 AGE
 GROUP       45-49        50-54        55-59        60-64        65-69        70-74        75-79        80-84         85+         TOTAL

  0- 4        60.          33.          60.          46.           29.           0.           0.           0.           0.       66987.
  5- 9       524.         206.          88.          50.          169.          71.          22.           0.           0.      125988.
 10-14     25078.       12180.        3867.         304.          299.         288.          54.           0.           0.      173511.
 15-19     71372.       54392.       26022.        5700.         1284.         893.         182.         345.          50.      244584.
 20-24     51785.       70041.       41578.       18570.         4098.         703.         260.         270.           0.      201532.
 25-29     14561.       59324.       51246.       28707.        11428.        1178.         297.         153.           0.      167786.
 30-34      1067.       11949.       17602.       12496.         5159.        1919.         236.         123.          77.       50982.
 35-39        56.         318.        3174.        2773.         2303.         850.         268.         130.           0.        9872.
 40-44         0.           7.           8.         157.          147.         113.          23.          13.           0.         473.
 45-49         0.          65.          89.         324.         1386.        1620.         972.         194.          76.        4726.
 50-54         0.           0.          71.          58.          481.         602.        1043.         213.         165.        2705.
 55-59         0.           0.          55.          50.            0.         114.         674.         290.         301.        1483.
 60-64         0.           0.           0.           0.            0.           0.          59.         140.           0.         200.
 65-69         0.           0.           0.           0.            0.           0.           0.          67.         145.         212.
 70-74         0.           0.           0.           0.            0.           0.           0.           0.           0.           0.
 75-79         0.           0.           0.           0.            0.           0.           0.           0.           0.           0.
 80-84         0.           0.           0.           0.            0.           0.           0.           0.           0.           0.
  85+          0.           0.           0.           0.            0.           0.           0.           0.           0.           0.

 TOTAL    164503.      208516.      143857.       69235.        20784.        8352.        4090.        1938.         814.     1051038.
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NUMBER OF CHILDREN
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	4185.	29340.	22935.	5321.	182.
5- 9	0.	0.	0.	35.	451.	12042.	49109.	34572.	12007.
10-14	0.	0.	0.	39.	38.	664.	18839.	61731.	40525.
15-19	0.	0.	0.	186.	349.	365.	1128.	21989.	53762.
20-24	0.	0.	0.	115.	166.	211.	73.	764.	10848.
25-29	0.	0.	0.	0.	100.	61.	0.	0.	388.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	66.	0.
40-44	0.	0.	0.	0.	0.	0.	1.	0.	3.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	375.	5289.	42683.	92086.	124442.	117714.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	54.	65.	61.	44.	29.	0.	0.	0.	0.	62216.
5- 9	447.	225.	92.	28.	27.	94.	45.	37.	0.	109168.
10-14	23395.	12727.	3574.	601.	398.	139.	91.	88.	0.	162849.
15-19	66501.	45932.	23790.	5172.	717.	500.	99.	89.	57.	220637.
20-24	48635.	67526.	42855.	18011.	4660.	771.	210.	163.	0.	195008.
25-29	5067.	28817.	25196.	14844.	6535.	1524.	71.	375.	74.	83051.
30-34	382.	5172.	10702.	8707.	5852.	2065.	764.	165.	0.	33809.
35-39	0.	242.	2500.	3546.	3530.	1750.	783.	111.	0.	12529.
40-44	0.	2.	8.	106.	204.	161.	86.	20.	7.	598.
45-49	0.	1.	0.	1.	5.	14.	11.	5.	2.	39.
50-54	0.	84.	0.	51.	488.	1136.	1783.	921.	313.	4775.
55-59	0.	0.	0.	0.	0.	/ 53.	962.	922.	411.	2348.
60-64	0.	0.	0.	0.	0.	0.	269.	220.	0.	489.
65-69	0.	0.	0.	0.	0.	0.	0.	70.	68.	138.
70-74	0.	0.	0.	0.	0.	0.	62.	0.	0.	62.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	144480.	160792.	108779.	51110.	22445.	8167.	5234.	3186.	932.	887715.

NUMBER OF CHILDREN
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	50.	1757.	3893.	1410.	61.
5- 9	0.	0.	0.	0.	126.	422.	3813.	6715.	3097.
10-14	0.	0.	0.	0.	679.	393.	1025.	4383.	7760.
15-19	0.	0.	0.	48.	583.	196.	316.	714.	4915.
20-24	0.	0.	0.	54.	126.	747.	137.	122.	682.
25-29	0.	0.	0.	0.	107.	222.	0.	72.	108.
30-34	0.	0.	0.	0.	130.	79.	158.	77.	48.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	36.
40-44	0.	0.	0.	1.	0.	3.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	103.	1803.	3819.	9342.	13493.	16707.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	26.	39.	62.	39.	27.	26.	0.	0.	0.	7391.
5- 9	173.	127.	170.	68.	60.	59.	0.	0.	0.	14831.
10-14	6203.	3208.	2664.	704.	333.	184.	0.	27.	0.	27564.
15-19	12702.	9802.	6960.	3191.	1435.	908.	42.	90.	139.	42040.
20-24	4974.	10005.	8148.	4794.	3630.	1666.	0.	94.	171.	35350.
25-29	862.	7847.	9482.	7288.	4855.	2054.	575.	145.	77.	33695.
30-34	113.	1116.	5131.	4977.	4135.	1862.	908.	309.	0.	19044.
35-39	44.	16.	540.	1884.	1745.	1522.	413.	220.	43.	6463.
40-44	0.	0.	0.	79.	207.	187.	89.	28.	4.	598.
45-49	0.	0.	0.	98.	1321.	2633.	1286.	589.	312.	6239.
50-54	0.	0.	0.	0.	206.	1125.	1377.	887.	317.	3912.
55-59	0.	0.	0.	0.	0.	0.	502.	632.	199.	1333.
60-64	0.	0.	0.	0.	0.	0.	180.	195.	181.	557.
65-69	0.	0.	0.	0.	0.	0.	1.	0.	137.	139.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	25097.	32159.	33158.	23123.	17954.	12228.	5373.	3217.	1580.	199154.

NUMBER OF CHILDREN
SINGLE HEADED HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	95.	1162.	3253.	1458.	73.
5- 9	0.	0.	0.	35.	0.	242.	3381.	6021.	3046.
10-14	0.	0.	0.	115.	336.	267.	719.	4240.	6858.
15-19	0.	0.	0.	0.	622.	661.	152.	867.	5285.
20-24	0.	0.	0.	0.	417.	1001.	69.	74.	577.
25-29	0.	0.	0.	0.	93.	462.	266.	197.	20.
30-34	0.	0.	0.	0.	66.	0.	305.	595.	0.
35-39	0.	0.	0.	39.	0.	0.	63.	135.	58.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	93.	0.	0.	131.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	189.	1630.	3889.	8207.	13587.	16047.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	25.	86.	15.	0.	1.	0.	0.	0.	0.	6167.
5- 9	150.	132.	113.	94.	64.	0.	0.	0.	0.	13277.
10-14	4935.	3055.	2214.	920.	222.	77.	27.	27.	30.	24043.
15-19	10906.	9526.	7147.	3006.	1909.	655.	39.	97.	0.	40872.
20-24	4688.	13031.	9633.	6272.	3713.	1492.	264.	210.	120.	41562.
25-29	457.	3506.	6401.	5162.	4311.	2353.	649.	187.	73.	24136.
30-34	39.	345.	1878.	3870.	4396.	2494.	528.	482.	0.	14997.
35-39	0.	18.	454.	1562.	3132.	2896.	1216.	556.	67.	10196.
40-44	10.	0.	1.	50.	128.	181.	115.	43.	15.	544.
45-49	0.	1.	0.	0.	8.	13.	11.	6.	4.	44.
50-54	0.	0.	0.	44.	96.	449.	1549.	1084.	287.	3735.
55-59	0.	0.	58.	0.	43.	99.	682.	403.	644.	1929.
60-64	0.	0.	0.	0.	0.	65.	0.	279.	131.	476.
65-69	0.	0.	0.	0.	0.	0.	0.	64.	0.	64.
70-74	0.	0.	0.	0.	0.	0.	56.	58.	0.	115.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	21210.	29700.	27913.	20982.	18022.	10775.	5138.	3497.	1371.	182157.

NUMBER OF PARENTS
INTACT HOUSEHOLDS
MALE MEMBERS

AGE GROUP	- AGE OF WIFE - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	1.	0.	0.	0.
45-49	0.	0.	0.	94.	281.	112.	0.	0.	0.
50-54	0.	0.	0.	196.	1751.	2284.	638.	88.	0.
55-59	0.	0.	0.	173.	2909.	8439.	4734.	1026.	0.
60-64	0.	0.	0.	32.	1509.	5986.	6235.	3412.	858.
65-69	0.	0.	0.	177.	3746.	12101.	13853.	12892.	9084.
70-74	0.	0.	0.	0.	2523.	7690.	11700.	11034.	10358.
75-79	0.	0.	0.	49.	1125.	3842.	5313.	6008.	8296.
80-84	0.	0.	0.	0.	354.	1678.	2565.	2958.	4223.
85+	0.	0.	0.	0.	187.	299.	999.	805.	999.
TOTAL	0.	0.	0.	721.	14384.	42432.	46037.	38223.	33818.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	487.
50-54	0.	0.	0.	75.	0.	0.	0.	0.	0.	5032.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	17282.
60-64	124.	43.	0.	0.	0.	0.	0.	0.	0.	18198.
65-69	2406.	310.	0.	0.	0.	0.	0.	0.	0.	54570.
70-74	7013.	1608.	0.	0.	0.	0.	0.	0.	0.	51925.
75-79	6825.	3630.	1055.	60.	0.	0.	0.	0.	0.	36202.
80-84	3481.	2714.	1436.	370.	56.	0.	0.	0.	0.	19836.
85+	1770.	1521.	857.	428.	61.	57.	0.	0.	0.	7983.
TOTAL	21618.	9826.	3348.	933.	117.	57.	0.	0.	0.	211514.

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                                                   NUMBER OF PARENTS
                                                   INTACT HOUSEHOLDS
                                                    FEMALE MEMBERS

 AGE                                                 - AGE OF WIFE -
GROUP       0-4       5-9     10-14     15-19     20-24     25-29     30-34     35-39     40-44

 0- 4        0.        0.        0.        0.        0.        0.        0.        0.        0.
 5- 9        0.        0.        0.        0.        0.        0.        0.        0.        0.
10-14        0.        0.        0.        0.        0.        0.        0.        0.        0.
15-19        0.        0.        0.        0.        0.        0.        0.        0.        0.
20-24        0.        0.        0.        0.        0.        0.        0.        0.        0.
25-29        0.        0.        0.        0.        0.        0.        0.        0.        0.
30-34        0.        0.        0.        0.        0.      124.        0.        0.        0.
35-39        0.        0.        0.        0.      134.        0.       48.        0.       76.
40-44        0.        0.        0.        0.        0.        0.        0.        0.        0.
45-49        0.        0.        0.        0.        0.        0.        0.        0.        0.
50-54        0.        0.        0.      632.    20360.    42818.    14556.     1015.      192.
55-59        0.        0.        0.      558.    20953.    65433.    56756.    17704.     1190.
60-64        0.        0.        0.      449.    15189.    57012.    74729.    53139.    21853.
65-69        0.        0.        0.      358.    10249.    39115.    59048.    64600.    53083.
70-74        0.        0.        0.      123.     3696.    17437.    42350.    45065.    52427.
75-79        0.        0.        0.       98.     1637.     7181.    14384.    19913.    28541.
80-84        0.        0.        0.       49.     1043.     3557.     5961.     8256.    12680.
85+          0.        0.        0.       43.      623.     2124.     3799.     2342.     3776.

TOTAL        0.        0.        0.     2310.    73884.   234800.   271630.   212034.   173818.

 AGE
GROUP     45-49     50-54     55-59     60-64     65-69     70-74     75-79     80-84       85+     TOTAL

 0- 4        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
 5- 9        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
10-14        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
15-19        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
20-24        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
25-29        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
30-34        0.        0.        0.        0.        0.        0.        0.        0.        0.      124.
35-39        0.        0.        0.        0.        0.        0.        0.        0.        0.      258.
40-44        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
45-49        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
50-54      217.        0.        0.        0.        0.        0.        0.        0.        0.    79790.
55-59       52.       65.        0.       57.        0.        0.        0.        0.        0.   162767.
60-64 2[illegible]1.      184.       62.        0.        0.        0.        0.        0.        0.   224699.
65-69    22421.     1996.      127.        0.        0.        0.        0.        0.        0.   250997.
70-74    36986.    14904.     1273.       64.        0.        0.        0.        0.        0.   216326.
75-79    34950.    25205.     8283.      663.        0.       64.        0.        0.        0.   140919.
80-84    17078.    20045.    11279.     3470.      409.       63.        0.        0.        0.    83890.
85+       6570.     8116.     6807.     2521.     1578.      372.       69.        0.        0.    38739.

TOTAL   122455.    70515.    27832.     6774.     1987.      499.       69.        0.        0.  1198507.
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NUMBER OF PARENTS
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	48.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	39.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	71.	154.	259.	80.	55.	35.
60-64	0.	0.	0.	0.	41.	134.	105.	103.	25.
65-69	0.	0.	0.	0.	58.	81.	503.	138.	285.
70-74	0.	0.	0.	46.	0.	141.	85.	162.	316.
75-79	0.	0.	0.	0.	55.	0.	247.	127.	344.
80-84	0.	0.	0.	0.	0.	72.	79.	124.	208.
85+	0.	0.	0.	0.	0.	0.	0.	0.	106.
TOTAL	0.	0.	0.	117.	356.	688.	1098.	709.	1358.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	48.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	39.
50-54	73.	0.	0.	0.	0.	0.	0.	0.	0.	73.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	653.
60-64	28.	0.	31.	0.	0.	0.	0.	0.	0.	466.
65-69	48.	57.	0.	0.	0.	0.	0.	0.	0.	1171.
70-74	262.	221.	47.	0.	0.	0.	0.	0.	0.	1280.
75-79	415.	259.	58.	0.	0.	0.	0.	0.	0.	1505.
80-84	107.	290.	112.	61.	0.	0.	0.	0.	0.	1053.
85+	248.	189.	61.	0.	0.	0.	0.	0.	0.	604.
TOTAL	1180.	1016.	308.	61.	0.	0.	0.	0.	0.	6893.

NUMBER OF PARENTS
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	1102.	1305.	714.	15.	0.
55-59	0.	0.	0.	135.	582.	1143.	2492.	1203.	59.
60-64	0.	0.	0.	216.	481.	1491.	3691.	3363.	1693.
65-69	0.	0.	0.	149.	132.	1156.	2786.	3686.	4553.
70-74	0.	0.	0.	0.	160.	205.	1242.	2834.	3925.
75-79	0.	0.	0.	0.	0.	464.	846.	681.	1990.
80-84	0.	0.	0.	0.	0.	0.	192.	282.	1365.
85+	0.	0.	0.	0.	0.	0.	0.	245.	423.
TOTAL	0.	0.	0.	500.	2456.	5763.	11963.	12309.	14009.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	3136.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	5613.
60-64	148.	0.	0.	0.	0.	0.	0.	0.	0.	11084.
65-69	2206.	535.	0.	0.	0.	0.	0.	0.	0.	15202.
70-74	4311.	2412.	333.	0.	0.	0.	0.	0.	0.	15422.
75-79	4128.	3370.	1659.	290.	0.	0.	0.	0.	0.	13427.
80-84	1652.	2519.	2048.	978.	249.	0.	0.	0.	0.	9285.
85+	564.	1712.	2385.	972.	475.	62.	0.	0.	65.	6903.
TOTAL	13009.	10548.	6425.	2240.	723.	62.	0.	0.	65.	80071.

NUMBER OF PARENTS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE MEMBERS

- AGE OF HEAD -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	144.	117.	0.	0.	0.	0.
50-54	0.	0.	0.	99.	287.	203.	243.	0.	0.
55-59	0.	0.	0.	0.	293.	1120.	81.	0.	0.
60-64	0.	0.	0.	35.	261.	984.	380.	113.	52.
65-69	0.	0.	0.	118.	493.	660.	416.	352.	280.
70-74	0.	0.	0.	0.	572.	536.	136.	62.	255.
75-79	0.	0.	0.	98.	104.	223.	71.	235.	0.
80-84	0.	0.	0.	43.	215.	0.	72.	63.	0.
85+	0.	0.	0.	52.	180.	74.	0.	0.	0.
TOTAL	0.	0.	0.	591.	2521.	3801.	1398.	825.	588.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	261.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	832.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	1494.
60-64	27.	0.	0.	0.	0.	0.	0.	0.	0.	1852.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	2319.
70-74	462.	0.	46.	0.	0.	0.	0.	0.	0.	2069.
75-79	166.	214.	48.	0.	0.	0.	0.	0.	0.	1160.
80-84	1.	0.	59.	112.	0.	0.	0.	0.	0.	565.
85+	59.	68.	127.	0.	0.	0.	0.	0.	0.	561.
TOTAL	714.	282.	279.	112.	0.	0.	0.	0.	0.	11112.

NUMBER OF PARENTS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE	- AGE OF HEAD -								
GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	75.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	477.	35.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	1607.	10996.	18262.	4915.	142.	0.
55-59	0.	0.	0.	1368.	9301.	21077.	8984.	2894.	171.
60-64	0.	0.	0.	1030.	5335.	12469.	6402.	4328.	2858.
65-69	0.	0.	0.	947.	2466.	7327.	5408.	2915.	3627.
70-74	0.	0.	0.	0.	992.	2061.	2469.	2142.	2078.
75-79	0.	0.	0.	0.	0.	999.	624.	763.	955.
80-84	0.	0.	0.	0.	0.	0.	325.	241.	465.
85+	0.	0.	0.	0.	0.	0.	0.	53.	56.
TOTAL	0.	0.	0.	5505.	29124.	62194.	29126.	13478.	10210.

AGE									
GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	75.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	511.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	35922.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	43794.
60-64	247.	0.	0.	0.	0.	0.	0.	0.	0.	32668.
65-69	3004.	502.	0.	0.	0.	0.	0.	0.	0.	26195.
70-74	2555.	2249.	233.	0.	0.	0.	0.	0.	0.	14779.
75-79	1270.	2273.	1525.	49.	0.	0.	0.	0.	0.	8459.
80-84	434.	698.	979.	894.	279.	0.	0.	0.	0.	4316.
85+	232.	158.	451.	289.	788.	215.	0.	0.	0.	2241.
TOTAL	7742.	5881.	3188.	1232.	1068.	215.	0.	0.	0.	168962.

NUMBER OF GRANDCHILDREN
INTACT HOUSEHOLDS
MALE MEMBERS

AGE GROUP	- AGE OF WIFE - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	396.	204.	1617.
5- 9	0.	0.	0.	0.	0.	0.	183.	337.	237.
10-14	0.	0.	0.	0.	0.	0.	48.	465.	126.
15-19	0.	0.	0.	0.	0.	0.	6.	0.	251.
20-24	0.	0.	0.	0.	0.	0.	4.	12.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	637.	1018.	2232.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	15908.	50151.	44017.	24552.	10318.	3077.	605.	316.	0.	151160.
5- 9	1543.	14295.	26834.	21408.	10325.	3834.	545.	286.	0.	79828.
10-14	515.	1665.	8982.	16554.	10836.	3616.	823.	195.	0.	43825.
15-19	389.	612.	1426.	3650.	2831.	1207.	548.	217.	0.	11138.
20-24	137.	206.	296.	182.	238.	556.	707.	232.	23.	2592.
25-29	0.	0.	215.	150.	46.	307.	394.	327.	79.	1518.
30-34	126.	0.	0.	46.	29.	158.	360.	275.	0.	996.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	33.	0.	0.	0.	0.	0.	0.	0.	33.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	18619.	66962.	81770.	66542.	34623.	12756.	3982.	1848.	102.	291089.

NUMBER OF GRANDCHILDREN
INTACT HOUSEHOLDS
FEMALE MEMBERS

AGE GROUP	- AGE OF WIFE - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	165.	258.	1452.
5- 9	0.	0.	0.	0.	0.	0.	244.	345.	150.
10-14	0.	0.	0.	0.	0.	0.	75.	296.	336.
15-19	0.	0.	0.	0.	0.	0.	13.	89.	178.
20-24	0.	0.	0.	0.	0.	0.	4.	0.	84.
25-29	0.	0.	0.	0.	0.	0.	8.	0.	59.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	508.	988.	2259.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	13940.	42018.	35800.	22612.	9305.	2605.	320.	117.	0.	128591.
5- 9	1346.	12112.	21213.	17857.	8165.	3320.	482.	75.	0.	65308.
10-14	309.	2390.	10334.	16868.	9224.	3400.	773.	106.	6.	44117.
15-19	296.	501.	1678.	3016.	2326.	1128.	626.	444.	8.	10302.
20-24	98.	539.	194.	224.	139.	448.	449.	339.	0.	2517.
25-29	44.	69.	52.	28.	34.	234.	373.	268.	0.	1168.
30-34	0.	0.	0.	111.	0.	41.	41.	70.	0.	263.
35-39	0.	0.	0.	0.	0.	0.	53.	0.	0.	53.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	16033.	57628.	69272.	60715.	29192.	11176.	3116.	1419.	14.	252320.

NUMBER OF GRANDCHILDREN
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	73.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	54.
10-14	0.	0.	0.	0.	0.	0.	0.	45.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	18.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	45.	144.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	2757.	9392.	10366.	7438.	4575.	1377.	381.	208.	187.	36754.
5- 9	357.	3634.	8642.	6817.	5885.	2020.	892.	213.	0.	28513.
10-14	58.	573.	4659.	7781.	7007.	3006.	1094.	288.	56.	24567.
15-19	41.	52.	707.	2122.	2715.	1785.	1116.	509.	73.	9119.
20-24	40.	57.	98.	191.	323.	679.	1038.	695.	82.	3222.
25-29	47.	0.	0.	27.	243.	701.	1120.	687.	140.	2964.
30-34	0.	72.	0.	0.	0.	142.	227.	283.	81.	804.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	3300.	13778.	24472.	24376.	20748.	9710.	5867.	2884.	620.	105943.

NUMBER OF GRANDCHILDREN
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	207.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	12.
10-14	0.	0.	0.	0.	0.	0.	0.	58.	13.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	58.	233.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	2404.	8801.	9684.	5927.	3657.	1234.	321.	335.	37.	32607.
5- 9	269.	2186.	6533.	6062.	4094.	1815.	516.	203.	10.	21701.
10-14	84.	1132.	3605.	5874.	5328.	2458.	843.	192.	9.	19598.
15-19	0.	175.	844.	1568.	1877.	1122.	1130.	377.	102.	7196.
20-24	0.	77.	46.	67.	451.	667.	1548.	397.	173.	3426.
25-29	0.	0.	97.	33.	106.	287.	279.	136.	133.	1071.
30-34	0.	0.	0.	0.	90.	0.	297.	81.	72.	539.
35-39	0.	15.	28.	0.	0.	0.	0.	0.	0.	43.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	2757.	12387.	20838.	19533.	15602.	7583.	4933.	1721.	537.	86180.

NUMBER OF GRANDCHILDREN
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	76.	35.	53.
5- 9	0.	0.	0.	0.	0.	0.	0.	78.	22.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	124.
15-19	0.	0.	0.	0.	0.	0.	34.	56.	50.
20-24	0.	0.	0.	0.	0.	0.	0.	25.	89.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	65.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	109.	194.	403.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	242.	1425.	3480.	4156.	3876.	1828.	727.	274.	182.	16353.
5- 9	19.	311.	1583.	3184.	3151.	3118.	783.	557.	17.	12824.
10-14	20.	65.	618.	1360.	2526.	2714.	1116.	650.	48.	9242.
15-19	12.	31.	37.	310.	715.	687.	640.	480.	193.	3253.
20-24	0.	0.	36.	28.	64.	177.	923.	441.	356.	2139.
25-29	0.	0.	0.	0.	44.	84.	637.	511.	169.	1444.
30-34	0.	0.	0.	0.	0.	0.	127.	197.	209.	598.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	10.	0.	0.	0.	10.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	293.	1832.	5753.	9037.	10376.	8617.	4955.	3117.	1175.	45862.

NUMBER OF GRANDCHILDREN
SINGLE HEADED HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	38.	32.	0.
5- 9	0.	0.	0.	0.	0.	0.	77.	33.	18.
10-14	0.	0.	0.	0.	0.	0.	53.	109.	40.
15-19	0.	0.	0.	0.	0.	0.	44.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	212.	174.	58.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	319.	1554.	3672.	3095.	3097.	1736.	993.	339.	83.	14958.
5- 9	0.	138.	1419.	1924.	3102.	2050.	504.	330.	28.	9622.
10-14	6.	73.	205.	1279.	2289.	2409.	954.	602.	92.	8112.
15-19	6.	0.	45.	281.	592.	540.	704.	445.	55.	2711.
20-24	7.	0.	36.	36.	56.	193.	596.	268.	129.	1321.
25-29	0.	25.	0.	0.	0.	26.	651.	181.	295.	1178.
30-34	0.	0.	0.	0.	0.	49.	0.	0.	0.	49.
35-39	0.	0.	0.	0.	0.	34.	43.	0.	0.	77.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	55.	0.	55.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	338.	1789.	5378.	6614.	9135.	7038.	4445.	2218.	683.	38083.

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                                                      NUMBER OF OTHERS
                                                      INTACT HOUSEHOLDS
                                                         MALE MEMBERS

 AGE                                                  - AGE OF WIFE -
GROUP        0-4        5-9       10-14      15-19      20-24      25-29      30-34      35-39      40-44

 0- 4          0.         0.         0.         0.         0.         0.         0.         0.         0.
 5- 9          0.         0.         0.         0.         0.         0.         0.         0.         0.
10-14          0.         0.         0.       152.      1963.      3190.      1928.       978.       890.
15-19          0.         0.         0.      1508.     28924.     64126.     44960.     25307.     15965.
20-24          0.         0.         0.      1347.     29476.     76556.     59052.     28448.     16848.
25-29          0.         0.         0.       927.     17472.     82714.     80883.     44177.     25143.
30-34          0.         0.         0.         0.      2603.     20386.     33188.     20830.     14132.
35-39          0.         0.         0.         0.         0.         0.         0.         0.         0.
40-44          0.         0.         0.         0.         0.         0.         0.         0.         0.
45-49          0.         0.         0.         0.       495.      5182.      7353.      4630.      6493.
50-54          0.         0.         0.         0.      1218.      6348.     11304.      8333.     14654.
55-59          0.         0.         0.         0.       301.      4609.      2463.      3828.      2158.
60-64          0.         0.         0.         0.         0.         0.         0.         0.         0.
65-69          0.         0.         0.         0.         0.         0.         0.         0.         0.
70-74          0.         0.         0.         0.         0.         0.         0.         0.         0.
75-79          0.         0.         0.         0.         0.         0.         0.         0.         0.
80-84          0.         0.         0.         0.         0.        24.         0.         0.         0.
 85+           0.         0.         0.         0.         0.         0.        67.        52.        62.

TOTAL          0.         0.         0.      3934.     82452.    263134.    241197.    136583.     96345.


 AGE
GROUP       45-49      50-54      55-59      60-64      65-69      70-74      75-79      80-84       85+        TOTAL

 0- 4          0.         0.         0.         0.         0.         0.         0.         0.         0.           1.
 5- 9          0.         0.         0.         0.         0.         0.         0.         0.         0.          -1.
10-14        782.       639.       457.       215.       131.        12.         0.         0.         0.       11337.
15-19      11935.      6833.      3814.      2237.      1488.       649.       393.         0.         0.      208138.
20-24      11113.      7841.      2834.      1927.       580.       485.        68.        53.         0.      236627.
25-29      14504.      9798.      5051.      2730.      1341.       202.         0.         0.         0.      284941.
30-34       9714.      3649.      3078.       858.      1041.       211.         0.         0.         0.      109690.
35-39          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
40-44          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
45-49       6936.      5091.      2786.      1272.       641.         0.         0.         0.         0.       40879.
50-54      19936.     18275.      5399.      3944.      2821.      3054.         0.         0.         0.       95285.
55-59       5569.      3453.      2631.      1534.       745.         0.       388.         0.         0.       27679.
60-64          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
65-69          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
70-74          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
75-79          0.         0.         0.         0.         0.         0.         0.         0.         0.           0.
80-84         22.        25.        22.         0.         1.        22.         0.         0.         0.         115.
 85+          93.         0.         0.         0.         0.         0.         0.         0.         0.         274.

TOTAL      80602.     55605.     26073.     14717.      8788.      4635.       848.        53.         0.     1014966.
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NUMBER OF OTHERS
INTACT HOUSEHOLDS
FEMALE MEMBERS

AGE GROUP	0-4	5-9	10-14	15-19	- AGE OF WIFE - 20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	210.	1926.	3394.	2422.	1206.	1251.
15-19	0.	0.	0.	556.	21398.	54163.	41603.	25143.	13667.
20-24	0.	0.	0.	312.	13726.	45629.	39513.	22105.	13233.
25-29	0.	0.	0.	19.	1188.	5125.	6035.	3850.	1959.
30-34	0.	0.	0.	0.	3303.	11220.	18207.	17062.	9651.
35-39	0.	0.	0.	0.	1722.	3228.	5907.	5438.	4638.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	14.	112.	79.	82.	76.
60-64	0.	0.	0.	0.	46.	1134.	895.	977.	795.
65-69	0.	0.	0.	0.	296.	887.	1023.	807.	628.
70-74	0.	0.	0.	0.	308.	520.	1426.	1544.	1339.
75-79	0.	0.	0.	0.	0.	217.	1492.	307.	158.
80-84	0.	0.	0.	0.	200.	647.	225.	395.	721.
85+	0.	0.	0.	0.	232.	755.	568.	208.	436.
TOTAL	0.	0.	0.	1097.	44360.	127029.	119394.	79123.	48553.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	1072.	721.	592.	482.	251.	53.	0.	0.	0.	13579.
15-19	11184.	7582.	5823.	2894.	782.	680.	119.	237.	0.	185830.
20-24	8831.	6666.	2179.	1432.	682.	523.	43.	0.	0.	154875.
25-29	1480.	904.	571.	282.	154.	0.	24.	0.	0.	21591.
30-34	7994.	5379.	2393.	303.	317.	274.	0.	0.	0.	76104.
35-39	3589.	1769.	1717.	418.	209.	382.	180.	196.	0.	29393.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	-1.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	64.	116.	53.	49.	17.	11.	5.	0.	0.	678.
60-64	453.	547.	808.	128.	162.	51.	0.	0.	0.	5996.
65-69	876.	646.	117.	206.	213.	127.	0.	0.	0.	5824.
70-74	1526.	504.	524.	117.	128.	265.	0.	0.	0.	8201.
75-79	1531.	926.	752.	380.	151.	0.	0.	0.	0.	5916.
80-84	680.	934.	462.	236.	227.	208.	0.	0.	0.	4935.
85+	0.	0.	6.	530.	0.	0.	0.	0.	0.	2734.
TOTAL	39280.	26695.	15995.	7457.	3292.	2574.	372.	434.	0.	515656.

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                                        NUMBER OF OTHERS
                              SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
                                          MALE MEMBERS

 AGE                                               - AGE OF HEAD -
GROUP       0-4        5-9       10-14      15-19      20-24      25-29      30-34      35-39      40-44

 0- 4        0.         0.         0.         0.         0.         0.         0.         0.         0.
 5- 9        0.         0.         0.         0.         0.         0.         0.         0.         0.
10-14        0.         0.         0.      1136.      1339.       370.        41.       117.       134.
15-19        0.         0.         0.      5839.     21527.      4996.      3248.      2456.      2720.
20-24        0.         0.         0.       160.      4674.      5415.      3074.      1725.      2152.
25-29        0.         0.         0.        84.      1238.      3225.      4483.      4874.      3159.
30-34        0.         0.         0.         0.         0.      1248.      1810.      2294.      2812.
35-39        0.         0.         0.         0.         0.         0.         0.         0.         0.
40-44        0.         0.         0.         0.         0.         0.         0.         0.         0.
45-49        0.         0.         0.         0.         0.         0.         0.       580.       764.
50-54        0.         0.         0.         0.         0.         0.         0.      2226.      4205.
55-59        0.         0.         0.         0.       309.         0.         0.         0.       837.
60-64        0.         0.         0.         0.         0.         0.         0.         0.         0.
65-69        0.         0.         0.         0.         0.         0.         0.         0.         0.
70-74        0.         0.         0.         0.         0.         0.         0.         0.         0.
75-79        0.         0.         0.         0.         0.         0.         0.         0.         0.
80-84        0.         0.         0.         0.         0.         0.         0.         0.         0.
85+          0.         0.         0.         0.         0.         0.         0.         0.         0.

TOTAL        0.         0.         0.      7219.     29086.     15254.     12656.     14272.     16785.

 AGE
GROUP      45-49      50-54      55-59      60-64      65-69      70-74      75-79      80-84       85+        TOTAL

 0- 4        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
 5- 9        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
10-14      183.       268.       179.       182.        99.        37.        12.         0.         0.       4096.
15-19     3439.      4510.      2687.      2034.      1336.       501.       526.         0.         0.      55819.
20-24     2713.      3188.      1496.      1517.       952.       495.       124.        59.         0.      27742.
25-29     2878.      3345.      2607.      2145.      1155.       622.       328.         0.         0.      30143.
30-34     1503.      1039.      1729.      1088.       707.         0.       200.         0.         0.      14430.
35-39        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
40-44        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
45-49     2331.      1961.       297.       680.       678.       340.         0.         0.         0.       7632.
50-54     6189.      3936.      9288.      1393.      1390.         0.         0.         0.         0.      28627.
55-59      919.      1639.       753.         0.       789.       738.         0.         0.         0.       5983.
60-64        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
65-69        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
70-74        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
75-79        0.         0.         0.         0.         0.         0.         0.         0.         0.          0.
80-84       16.         0.         0.         0.         0.         0.         0.         0.         0.         16.
85+          0.         0.         0.         0.         0.         0.         0.         0.         0.          0.

TOTAL    20172.     19886.     19036.      9039.      7106.      2733.      1190.        59.         0.     174490.
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NUMBER OF OTHERS
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1175.	1104.	324.	119.	161.	180.
15-19	0.	0.	0.	6967.	26528.	6323.	3525.	2567.	2516.
20-24	0.	0.	0.	340.	7734.	8487.	4841.	2682.	2291.
25-29	0.	0.	0.	0.	188.	877.	636.	749.	361.
30-34	0.	0.	0.	240.	914.	1360.	1660.	4185.	3351.
35-39	0.	0.	0.	0.	144.	388.	666.	1658.	1054.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	4.	4.	16.	0.	6.	21.
60-64	0.	0.	0.	39.	0.	0.	58.	147.	43.
65-69	0.	0.	0.	0.	0.	208.	0.	64.	108.
70-74	0.	0.	0.	0.	0.	0.	0.	120.	104.
75-79	0.	0.	0.	0.	0.	152.	404.	164.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	8764.	36615.	18135.	11909.	12503.	10029.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	333.	377.	376.	314.	97.	30.	74.	0.	27.	4692.
15-19	2610.	2152.	1755.	1432.	1111.	462.	589.	311.	60.	58907.
20-24	2082.	1897.	1700.	767.	997.	343.	89.	41.	0.	34289.
25-29	414.	468.	238.	115.	91.	23.	22.	0.	0.	4185.
30-34	3624.	3242.	1787.	345.	248.	903.	0.	0.	0.	21857.
35-39	1453.	1318.	0.	430.	429.	0.	414.	0.	0.	7955.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	32.	36.	0.	29.	0.	11.	5.	0.	0.	162.
60-64	1.	272.	51.	257.	62.	94.	1.	58.	0.	1083.
65-69	59.	233.	415.	428.	0.	73.	65.	0.	0.	1653.
70-74	201.	0.	0.	678.	0.	127.	0.	0.	121.	1350.
75-79	142.	358.	179.	192.	0.	0.	0.	169.	0.	1760.
80-84	180.	0.	473.	0.	0.	0.	0.	244.	0.	897.
85+	0.	0.	0.	0.	0.	0.	0.	249.	0.	249.
TOTAL	11132.	10352.	6974.	4988.	3036.	2065.	1259.	1072.	208.	139041.

NUMBER OF OTHERS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE MEMBERS

- AGE OF HEAD -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1178.	1984.	1403.	282.	75.	42.
15-19	0.	0.	0.	8526.	25469.	25988.	4597.	838.	507.
20-24	0.	0.	0.	886.	10495.	29521.	6739.	1738.	661.
25-29	0.	0.	0.	146.	1657.	12445.	12405.	3130.	1317.
30-34	0.	0.	0.	228.	844.	1853.	2595.	1820.	2229.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	216.	0.	0.	0.	228.
50-54	0.	0.	0.	1846.	0.	0.	0.	1115.	0.
55-59	0.	0.	0.	294.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	39.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	13144.	40666.	71209.	26618.	8714.	4985.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	21.	46.	26.	24.	49.	10.	0.	0.	23.	5164.
15-19	578.	524.	315.	342.	397.	126.	233.	51.	52.	68542.
20-24	656.	447.	241.	231.	280.	53.	62.	62.	0.	52072.
25-29	1127.	369.	110.	110.	520.	204.	187.	0.	101.	33826.
30-34	197.	1161.	626.	205.	4.	4.	0.	0.	0.	11766.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	896.	786.	327.	285.	0.	289.	0.	0.	0.	3027.
50-54	2505.	1707.	0.	3981.	0.	1184.	0.	0.	0.	12338.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	294.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	16.	0.	0.	0.	0.	16.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	39.
TOTAL	5980.	5039.	1644.	5178.	1266.	1870.	483.	113.	176.	187083.

NUMBER OF OTHERS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1231.	1962.	1350.	285.	66.	36.
15-19	0.	0.	0.	6658.	22656.	26759.	4559.	877.	351.
20-24	0.	0.	0.	3312.	8098.	22718.	5564.	1446.	555.
25-29	0.	0.	0.	168.	853.	1368.	1723.	344.	259.
30-34	0.	0.	0.	216.	1322.	6352.	2626.	1955.	1908.
35-39	0.	0.	0.	0.	287.	998.	1356.	192.	468.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	11.	0.	0.	18.
60-64	0.	0.	0.	78.	0.	110.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	76.	76.	0.	101.
70-74	0.	0.	0.	0.	108.	0.	0.	125.	121.
75-79	0.	0.	0.	0.	0.	201.	0.	0.	0.
80-84	0.	0.	0.	0.	180.	0.	0.	194.	0.
85+	0.	0.	0.	0.	0.	277.	0.	0.	202.
TOTAL	0.	0.	0.	11663.	35465.	60219.	16189.	5200.	4019.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	64.	88.	31.	30.	65.	15.	0.	15.	0.	5239.
15-19	623.	387.	494.	120.	338.	197.	0.	0.	54.	64072.
20-24	474.	242.	127.	310.	179.	205.	0.	38.	0.	43268.
25-29	88.	88.	48.	86.	22.	94.	0.	0.	46.	5188.
30-34	535.	1041.	520.	11.	262.	0.	0.	0.	0.	16747.
35-39	744.	517.	203.	0.	0.	8.	191.	0.	191.	5154.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	13.	5.	15.	5.	0.	0.	0.	0.	67.
60-64	82.	0.	158.	97.	0.	104.	0.	0.	0.	629.
65-69	0.	84.	79.	77.	0.	0.	0.	0.	0.	492.
70-74	0.	0.	143.	0.	0.	119.	0.	0.	0.	616.
75-79	0.	0.	0.	160.	0.	333.	0.	0.	0.	694.
80-84	0.	0.	0.	204.	0.	0.	0.	0.	0.	578.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	479.
TOTAL	2610.	2459.	1808.	1111.	871.	1075.	191.	53.	291.	143223.

NUMBER OF OTHERS
PRIMARY INDIVIDUAL HOUSEHOLDS, MALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1035.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	34128.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	28564.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	36196.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	14210.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	35163.	28564.	36196.	14210.	0.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	1035.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	34128.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	28564.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	36196.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	14210.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	7969.	0.	0.	0.	0.	0.	0.	0.	0.	7969.
50-54	0.	27345.	0.	0.	0.	0.	0.	0.	0.	27345.
55-59	0.	0.	4685.	0.	0.	0.	0.	0.	0.	4685.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	37.	0.	0.	37.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	7969.	27345.	4685.	0.	0.	0.	37.	0.	0.	154169.

NUMBER OF OTHERS
PRIMARY INDIVIDUAL HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF OTHERS
PRIMARY INDIVIDUAL HOUSEHOLDS, FEMALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF OTHERS
PRIMARY INDIVIDUAL HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1590.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	32966.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	27388.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	4755.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	27822.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	11026.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	34555.	27388.	4755.	27822.	11026.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	1590.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	32966.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	27388.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	4755.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	27822.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	11026.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	322.	0.	0.	0.	0.	0.	0.	322.
60-64	0.	0.	0.	2618.	0.	0.	0.	0.	0.	2618.
65-69	0.	0.	0.	0.	2690.	0.	0.	0.	0.	2690.
70-74	0.	0.	0.	0.	0.	2910.	0.	0.	0.	2910.
75-79	0.	0.	0.	0.	0.	0.	1209.	0.	0.	1209.
80-84	0.	0.	0.	0.	0.	0.	817.	0.	0.	817.
85+	0.	0.	0.	0.	0.	0.	0.	0.	891.	891.
TOTAL	0.	0.	322.	2618.	2690.	2910.	2027.	0.	891.	117004.

TOTAL NUMBER OF MEMBERS
INTACT HOUSEHOLDS
MALE MEMBERS

AGE GROUP	- AGE OF WIFE - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	5283.	255854.	1013635.	629309.	94391.	4448.
5- 9	0.	0.	0.	79.	12868.	301542.	995060.	530015.	140514.
10-14	0.	0.	0.	279.	2792.	15492.	301567.	752199.	429154.
15-19	0.	0.	0.	2266.	30730.	67434.	67066.	237974.	522072.
20-24	0.	0.	0.	11982.	106045.	85216.	61362.	34846.	104344.
25-29	0.	0.	0.	11452.	411558.	562231.	96955.	45984.	30672.
30-34	0.	0.	0.	2164.	157341.	883817.	527879.	36936.	15058.
35-39	0.	0.	0.	127.	13308.	217129.	784165.	386771.	19046.
40-44	0.	0.	0.	52.	1306.	22528.	231739.	602844.	331438.
45-49	0.	0.	0.	204.	1342.	8906.	32816.	164616.	487313.
50-54	0.	0.	0.	258.	3556.	10117.	16262.	31599.	163887.
55-59	0.	0.	0.	173.	3378.	13716.	8829.	12786.	35465.
60-64	0.	0.	0.	32.	1778.	6706.	6757.	5416.	8620.
65-69	0.	0.	0.	177.	3920.	12495.	14134.	13932.	11576.
70-74	0.	0.	0.	59.	2574.	7749.	11848.	11587.	11360.
75-79	0.	0.	0.	49.	1125.	3901.	5384.	6064.	8592.
80-84	0.	0.	0.	0.	354.	1701.	2630.	2958.	4276.
85+	0.	0.	0.	0.	187.	299.	1128.	857.	1110.
TOTAL	0.	0.	0.	34635.	1010015.	3234604.	3794879.	2971765.	2328939.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	16463.	50358.	44240.	24797.	10400.	3130.	605.	316.	0.	2153221.
5- 9	5727.	15564.	27107.	21503.	10391.	3852.	545.	286.	0.	2065048.
10-14	170029.	58994.	22364.	17842.	11511.	3792.	903.	195.	0.	1787108.
15-19	448364.	203788.	77391.	17958.	6078.	2454.	1080.	217.	0.	1684867.
20-24	289612.	243026.	106565.	39580.	8132.	1822.	969.	285.	23.	1093808.
25-29	97020.	213591.	128680.	57360.	18696.	2888.	692.	327.	79.	1678184.
30-34	14917.	53604.	62296.	30243.	13599.	3928.	763.	355.	0.	1802897.
35-39	1080.	1161.	12917.	12183.	5055.	2249.	382.	84.	0.	1455652.
40-44	21794.	437.	410.	785.	730.	213.	96.	4.	4.	1214374.
45-49	289293.	18880.	3490.	2649.	7109.	3233.	1664.	0.	0.	1021513.
50-54	405637.	228206.	16314.	4537.	3679.	6234.	1208.	278.	0.	891771.
55-59	159094.	292398.	153314.	13665.	1175.	413.	1602.	579.	0.	696587.
60-64	35668.	116397.	168871.	89977.	11180.	597.	117.	337.	63.	452537.
65-69	12600.	33997.	78743.	89717.	53033.	6737.	272.	0.	0.	331332.
70-74	9869.	11692.	19587.	37066.	41357.	21968.	2909.	64.	0.	189709.
75-79	7411.	4954.	5526.	7997.	13464.	11310.	6480.	672.	60.	82989.
80-84	3559.	3094.	2565.	2401.	2253.	3872.	2577.	1857.	64.	34162.
85+	1863.	1776.	920.	883.	618.	697.	741.	765.	131.	11974.
TOTAL	1990037.	1551914.	931299.	471140.	218458.	79390.	23605.	6621.	425.	18647712.

TOTAL NUMBER OF MEMBERS
INTACT HOUSEHOLDS
FEMALE MEMBERS

- AGE OF WIFE -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	4757.	245667.	966105.	567180.	84061.	4118.
5- 9	0.	0.	0.	83.	12175.	283961.	941832.	482292.	129044.
10-14	0.	0.	0.	332.	2601.	15917.	277127.	695377.	396283.
15-19	0.	0.	0.	25159.	22133.	56493.	60735.	211402.	466340.
20-24	0.	0.	0.	312.	655015.	46504.	40791.	26045.	88239.
25-29	0.	0.	0.	19.	1420.	1599603.	6437.	4103.	3305.
30-34	0.	0.	0.	0.	3454.	11504.	1575578.	17324.	9651.
35-39	0.	0.	0.	0.	1856.	3228.	5954.	1206397.	4764.
40-44	0.	0.	0.	0.	0.	3.	1.	0.	1026274.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	632.	20360.	42818.	14556.	1015.	192.
55-59	0.	0.	0.	558.	20968.	65544.	56835.	17786.	1266.
60-64	0.	0.	0.	449.	15235.	58215.	75624.	54116.	22648.
65-69	0.	0.	0.	358.	10545.	40002.	60071.	65406.	53711.
70-74	0.	0.	0.	123.	4004.	17957.	43776.	46609.	53766.
75-79	0.	0.	0.	98.	1637.	7398.	15876.	20220.	28699.
80-84	0.	0.	0.	49.	1243.	4203.	6186.	8650.	13402.
85+	0.	0.	0.	43.	854.	2879.	4366.	2550.	4212.
TOTAL	0.	0.	0.	32972.	1019168.	3222330.	3752921.	2943352.	2305911.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	14493.	42256.	35999.	22764.	9461.	2663.	320.	117.	0.	1999955.
5- 9	5055.	13281.	21531.	18029.	8389.	3403.	502.	75.	0.	1919645.
10-14	157282.	55032.	23423.	18594.	9929.	3642.	827.	106.	6.	1656476.
15-19	399853.	187958.	74375.	19205.	4683.	2145.	835.	681.	8.	1532002.
20-24	277989.	265464.	112149.	44218.	9263.	1833.	595.	339.	0.	1568755.
25-29	29518.	108995.	77357.	37789.	14594.	2959.	784.	268.	0.	1887151.
30-34	8847.	21655.	35849.	23612.	10486.	4280.	515.	317.	0.	1723069.
35-39	3729.	2103.	9820.	15792.	10278.	4077.	1005.	264.	0.	1269266.
40-44	3.	2.	31.	259.	505.	240.	83.	4.	4.	1027408.
45-49	894200.	1.	1.	3.	20.	27.	12.	3.	0.	894267.
50-54	217.	675742.	53.	144.	240	1146.	1357.	446.	0.	758917.
55-59	117.	181.	435961.	106.	17.	64.	761.	486.	0.	600649.
60-64	2534.	732.	870.	240172.	162.	51.	0.	70.	[illegible]	470947.
65-69	23296.	2642.	244.	206.	122706.	127.	0.	144.	0.	379459.
70-74	40512.	15409.	1797.	181.	128.	45503.	0.	0.	0.	269765.
75-79	36481.	26131.	9035.	1043.	151.	64.	13176.	0.	0.	160011.
80-84	17758.	20479.	11741.	3706.	636.	272.	0.	3358.	0.	92183.
85+	6570.	8116.	6813.	3050.	1578.	372.	69.	0.	255.	41728.
TOTAL	1918452.	1446676.	857049.	448873.	203226.	72867.	20841.	6677.	342.	10251616.

TOTAL NUMBER OF MEMBERS
SINGLE HEADED HOUSEHOLDS, FEMALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	42.	5371.	27383.	27460.	6246.	331.
5- 9	0.	0.	0.	38.	266.	14127.	59167.	38763.	12550.
10-14	0.	0.	0.	1348.	1573.	1197.	21400.	65396.	43709.
15-19	0.	0.	0.	6093.	21855.	5346.	5426.	25845.	60566.
20-24	0.	0.	0.	160.	4719.	5574.	3118.	2559.	15315.
25-29	0.	0.	0.	84.	1238.	3365.	4543.	4909.	3818.
30-34	0.	0.	0.	0.	111.	1331.	1810.	2362.	2951.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	6.
45-49	0.	0.	0.	0.	0.	0.	0.	580.	804.
50-54	0.	0.	0.	0.	0.	0.	0.	2226.	4277.
55-59	0.	0.	0.	71.	463.	259.	80.	55.	872.
60-64	0.	0.	0.	0.	41.	134.	105.	103.	25.
65-69	0.	0.	0.	0.	58.	81.	503.	138.	285.
70-74	0.	0.	0.	46.	0.	141.	85.	162.	316.
75-79	0.	0.	0.	0.	55.	0.	247.	127.	344.
80-84	0.	0.	0.	0.	0.	72.	79.	124.	208.
85+	0.	0.	0.	0.	0.	0.	0.	0.	106.
TOTAL	0.	0.	0.	7880.	35750.	59011.	124022.	149594.	146480.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	2817.	9424.	10426.	7484.	4604.	1377.	381.	208.	187.	103741.
5- 9	881.	3840.	8731.	6866.	6054.	2092.	914.	213.	0.	154501.
10-14	25320.	13020.	8706.	8267.	7405.	3331.	1160.	288.	56.	202174.
15-19	74852.	58954.	29416.	9857.	5335.	3179.	1824.	854.	123.	309523.
20-24	54537.	73286.	43171.	20278.	5373.	1877.	1422.	1024.	82.	232496.
25-29	17486.	62668.	53852.	30879.	12826.	2500.	1745.	840.	140.	200894.
30-34	2570.	13060.	19331.	13584.	5867.	2061.	663.	406.	158.	66264.
35-39	56.	318.	3174.	2773.	2303.	850.	268.	130.	0.	9872.
40-44	0.	7.	8.	157.	147.	113.	23.	13.	0.	473.
45-49	2331.	2027.	387.	1003.	2064.	1961.	972.	194.	76.	12398.
50-54	6263.	3936.	9359.	1451.	1870.	602.	1043.	213.	165.	31405.
55-59	919.	1639.	808.	50.	789.	852.	674.	290.	301.	8119.
60-64	28.	0.	31.	0.	0.	0.	59.	140.	0.	666.
65-69	48.	57.	0.	0.	0.	0.	0.	67.	145.	1383.
70-74	262.	221.	47.	0.	0.	0.	0.	0.	0.	1280.
75-79	415.	259.	58.	0.	0.	0.	0.	0.	0.	1505.
80-84	123.	290.	112.	61.	0.	0.	0.	0.	0.	1069.
85+	248.	189.	61.	0.	0.	0.	0.	0.	0.	604.
TOTAL	189155.	243196.	187673.	102710.	54637.	20795.	11147.	4881.	1434.	1338362.

TOTAL NUMBER OF MEMBERS
SINGLE HEADED HOUSEHULDS. FEMALE HEADS
FEMALF MEMBERS

AGF GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	4185.	29340.	22935.	5321.	389.
5- 9	0.	0.	0.	35.	451.	12042.	49109.	34572.	12019.
10-14	0.	0.	0.	1214.	1141.	988.	18959.	61950.	40718.
15-19	0.	0.	0.	28530.	26877.	6689.	4653.	24556.	56278.
20-24	0.	0.	0.	454.	74453.	8698.	4914.	3447.	13139.
25-29	0.	0.	0.	0.	288.	65828.	636.	749.	749.
30-34	0.	0.	0.	240.	914.	1360.	99311.	4185.	3351.
35-39	0.	0.	0.	0.	144.	388.	666.	118401.	1054.
40-44	0.	0.	0.	0.	0.	0.	1.	0.	128219.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	1102.	1305.	714.	15.	0.
55-59	0.	0.	0.	139.	586.	1159.	2492.	1208.	79.
60-64	0.	0.	0.	255.	481.	1491.	3749.	3509.	1737.
65-69	0.	0.	0.	149.	132.	1363.	2786.	3750.	4661.
70-74	0.	0.	0.	0.	160.	205.	1242.	2954.	4029.
75-79	0.	0.	0.	0.	0.	616.	1250.	844.	1990.
80-84	0.	0.	0.	0.	0.	0.	192.	282.	1365.
85+	0.	0.	0.	0.	0.	0.	0.	245.	423.
TOTAL	0.	0.	0.	31016.	110913.	131471.	213608.	265989.	270200.

AGF GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	2458.	8866.	9745.	5972.	3686.	1234.	321.	335.	37.	94823.
5- 9	716.	2411.	6625.	6090.	4120.	1869.	560.	240.	10.	130869.
10-14	23812.	14236.	7555.	6790.	5824.	2627.	1008.	280.	36.	187139.
15-19	69111.	48260.	26389.	8173.	3704.	2084.	1818.	776.	219.	308117.
20-24	50717.	69499.	44601.	18845.	6107.	1780.	1846.	601.	173.	299275.
25-29	5481.	29285.	25532.	14993.	6732.	1834.	372.	511.	207.	153197.
30-34	4006.	8414.	12489.	9051.	6191.	2968.	1060.	245.	72.	153857.
35-39	1453.	1575.	2528.	3977.	3959.	1750.	1197.	111.	0.	137203.
40-44	0.	2.	8.	106.	204.	161.	86.	20.	7.	128814.
45-49	161937.	1.	0.	1.	5.	14.	11.	5.	2.	161976.
50-54	0.	186095.	0.	51.	488.	1136.	1783.	921.	313.	193923.
55-59	32.	36.	151055.	29.	0.	63.	967.	922.	411.	159178.
60-64	149.	272.	51.	92904.	62.	94.	270.	279.	0.	105302.
65-69	2265.	767.	415.	428.	57626.	73.	65.	70.	68.	74620.
70-74	4511.	2412.	333.	678.	0.	30399.	62.	0.	121.	47107.
75-79	4270.	3728.	1838.	482.	0.	0.	13471.	169.	0.	28658.
80-84	1832.	2519.	2521.	978.	249.	0.	0.	5808.	0.	15746.
85+	564.	1712.	2385.	972.	475.	62.	0.	249.	1629.	8717.
TOTAL	333315.	380090.	294071.	170517.	99432.	48149.	24898.	[illegible]	3307.	2388515.

TOTAL NUMBER OF MEMBERS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
MALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	50.	1757.	3968.	1445.	113.
5- 9	0.	0.	0.	0.	126.	422.	3813.	6793.	3119.
10-14	0.	0.	0.	1178.	2663.	1796.	1307.	4458.	7926.
15-19	0.	0.	0.	37787.	26053.	26184.	4946.	1608.	5473.
20-24	0.	0.	0.	940.	90350.	30268.	6876.	1885.	1433.
25-29	0.	0.	0.	146.	1765.	127191.	12405.	3201.	1425.
30-34	0.	0.	0.	228.	974.	1932.	43629.	1896.	2342.
35-39	0.	0.	0.	0.	0.	0.	0.	23352.	36.
40-44	0.	0.	0.	1.	0.	3.	0.	0.	25726.
45-49	0.	0.	0.	144.	333.	0.	0.	0.	228.
50-54	0.	0.	0.	1945.	287.	203.	243.	1115.	0.
55-59	0.	0.	0.	294.	293.	1120.	81.	0.	0.
60-64	0.	0.	0.	35.	261.	984.	380.	113.	52.
65-69	0.	0.	0.	118.	493.	660.	416.	352.	280.
70-74	0.	0.	0.	0.	572.	536.	136.	62.	255.
75-79	0.	0.	0.	98.	104.	223.	71.	235.	0.
80-84	0.	0.	0.	43.	215.	0.	72.	63.	0.
85+	0.	0.	0.	91.	180.	74.	0.	0.	0.
TOTAL	0.	0.	0.	43051.	124718.	193353.	78342.	46579.	48409.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	268.	1464.	3542.	4195.	3904.	1854.	727.	274.	182.	23744.
5- 9	192.	438.	1752.	3252.	3212.	3177.	783.	557.	17.	27654.
10-14	6245.	3319.	3308.	2088.	2908.	2907.	1117.	677.	71.	41969.
15-19	13292.	10357.	7313.	3842.	2547.	1721.	914.	628.	384.	143048.
20-24	5630.	10452.	8425.	5053.	3973.	1896.	986.	597.	527.	169288.
25-29	1989.	8216.	9592.	7398.	5419.	2342.	1400.	656.	346.	183490.
30-34	310.	2277.	5756.	5182.	4140.	1866.	1036.	506.	209.	72284.
35-39	44.	16.	540.	1884.	1745.	1522.	413.	220.	43.	29815.
40-44	0.	0.	0.	79.	207.	187.	89.	26.	4.	26325.
45-49	30769.	786.	327.	383.	1321.	2931.	1286.	589.	312.	39409.
50-54	2505.	36533.	0.	3981.	206.	2309.	1377.	887.	317.	51909.
55-59	0.	0.	32835.	0.	0.	0.	502.	632.	199.	35956.
60-64	27.	0.	0.	25655.	0.	0.	180.	195.	181.	28064.
65-69	0.	0.	0.	0.	23925.	0.	1.	0.	137.	26382.
70-74	462.	0.	46.	0.	0.	17128.	0.	0.	0.	19197.
75-79	166.	214.	48.	0.	0.	0.	7799.	0.	0.	8958.
80-84	1.	0.	59.	112.	16.	0.	0.	5378.	0.	5959.
85+	59.	68.	127.	0.	0.	0.	0.	0.	2300.	2899.
TOTAL	61957.	74139.	73670.	63105.	53521.	39842.	18609.	11825.	5230.	936348.

TOTAL NUMBER OF MEMBERS
SINGLE HEADED HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	95.	1162.	3291.	1490.	73.
5- 9	0.	0.	0.	35.	0.	242.	3458.	6054.	3064.
10-14	0.	0.	0.	1345.	2299.	1617.	1057.	4415.	6935.
15-19	0.	0.	0.	6658.	23278.	27419.	4755.	1744.	5636.
20-24	0.	0.	0.	3312.	8515.	23720.	5632.	1520.	1132.
25-29	0.	0.	0.	168.	946.	1829.	1989.	541.	279.
30-34	0.	0.	0.	291.	1387.	6352.	2930.	2550.	1908.
35-39	0.	0.	0.	516.	322.	998.	1419.	327.	526.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	1607.	10996.	18356.	4915.	142.	131.
55-59	0.	0.	0.	1368.	9301.	21088.	8984.	2894.	188.
60-64	0.	0.	0.	1108.	5335.	12579.	6402.	4328.	2858.
65-69	0.	0.	0.	947.	2466.	7402.	5483.	2915.	3728.
70-74	0.	0.	0.	0.	1100.	2061.	2469.	2268.	2199.
75-79	0.	0.	0.	0.	0.	1199.	624.	763.	955.
80-84	0.	0.	0.	0.	180.	0.	325.	435.	465.
85+	0.	0.	0.	0.	0.	277.	0.	53.	258.
TOTAL	0.	0.	0.	17357.	66219.	126302.	53734.	32439.	30334.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	344.	1640.	3687.	3095.	3097.	1736.	993.	339.	83.	21126.
5- 9	150.	270.	1532.	2018.	3166.	2050.	504.	330.	28.	22899.
10-14	5006.	3215.	2450.	2230.	2576.	2502.	981.	644.	122.	37394.
15-19	11535.	9912.	7686.	3407.	2839.	1392.	742.	542.	109.	107654.
20-24	5168.	13273.	9796.	6618.	3948.	1891.	860.	516.	249.	86152.
25-29	545.	3619.	6448.	5248.	4333.	2474.	1300.	368.	414.	30502.
30-34	574.	1386.	2398.	3881.	4657.	2543.	528.	482.	0.	31868.
35-39	744.	535.	657.	1562.	3132.	2938.	1450.	556.	257.	15939.
40-44	10.	0.	1.	50.	128.	181.	115.	43.	15.	544.
45-49	0.	1.	0.	0.	8.	13.	11.	6.	4.	44.
50-54	0.	0.	0.	44.	96.	449.	1549.	1084.	287.	39657.
55-59	0.	13.	63.	15.	48.	99.	682.	458.	644.	45846.
60-64	329.	0.	158.	97.	0.	169.	0.	279.	131.	33772.
65-69	3004.	586.	79.	77.	0.	0.	0.	64.	0.	26751.
70-74	2555.	2249.	376.	0.	0.	119.	56.	58.	0.	15510.
75-79	1270.	2273.	1525.	209.	0.	333.	0.	0.	0.	9153.
80-84	434.	698.	979.	1098.	279.	0.	0.	0.	0.	4894.
85+	232.	158.	451.	289.	788.	215.	0.	0.	0.	2720.
TOTAL	31900.	39830.	38288.	29939.	29096.	19104.	9773.	5769.	2344.	532425.

TOTAL NUMBER OF MEMBERS
PRIMARY INDIVIDUAL HOUSEHOLDS, MALE HEADS
MALE MEMBERS

- AGE OF HEAD -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1035.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	56588.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	47381.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	49555.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	16849.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	1519.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	951.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	57622.	47381.	49555.	16849.	1519.	951.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	1035.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	56588.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	47381.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	49555.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	16849.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	1519.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	951.
45-49	8906.	0.	0.	0.	0.	0.	0.	0.	0.	8906.
50-54	0.	28163.	0.	0.	0.	0.	0.	0.	0.	28163.
55-59	0.	0.	5145.	0.	0.	0.	0.	0.	0.	5145.
60-64	0.	0.	0.	351.	0.	0.	0.	0.	0.	351.
65-69	0.	0.	0.	0.	395.	0.	0.	0.	0.	395.
70-74	0.	0.	0.	0.	0.	236.	0.	0.	0.	236.
75-79	0.	0.	0.	0.	0.	0.	94.	0.	0.	94.
80-84	0.	0.	0.	0.	0.	0.	37.	37.	0.	75.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	8906.	28163.	5145.	351.	395.	236.	131.	37.	0.	217240.

TOTAL NUMBER OF MEMBERS
PRIMARY INDIVIDUAL HOUSEHOLDS, MALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TOTAL NUMBER OF MEMBERS
PRIMARY INDIVIDUAL HOUSEHOLDS, FEMALE HEADS
MALE MEMBERS

- AGE OF HEAD -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

APPENDIX A.

Appendix A. Headship rates, by household type and age of head: Six

Household type and country (year)	15–19	20–24	25–29	30–34	35–39	40–44
Combined, males						
Indonesia (1976)	0.023	0.253	0.608	0.834	0.930	0.954
Republic of Korea (1970)	0.027	0.090	0.471	0.832	0.905	0.946
Republic of Korea (1980)	0.032	0.102	0.510	0.844	0.923	0.953
Malaysia (1980)	0.030	0.185	0.466	0.706	0.794	0.889
Philippines (1975)	0.020	0.229	0.573	0.783	0.875	0.915
Taiwan (1980)	0.016	0.083	0.593	0.858	0.938	0.956
Thailand (1970)	0.016	0.204	0.549	0.754	0.846	0.913
Thailand (1980)	0.019	0.201	0.529	0.740	0.844	0.902
Combined, females						
Indonesia (1976)	0.005	0.013	0.027	0.057	0.095	0.152
Republic of Korea (1970)	0.008	0.021	0.027	0.046	0.085	0.127
Republic of Korea (1980)	0.027	0.063	0.048	0.063	0.092	0.124
Malaysia (1980)	0.014	0.046	0.051	0.072	0.099	0.129
Philippines (1975)	0.001	0.004	0.012	0.025	0.042	0.066
Taiwan (1980)	0.011	0.035	0.026	0.030	0.040	0.039
Thailand (1970)	0.004	0.016	0.029	0.044	0.071	0.111
Thailand (1980)	0.006	0.021	0.034	0.051	0.080	0.108
Intact						
Indonesia (1976)	0.013	0.225	0.579	0.809	0.904	0.926
Republic of Korea (1970)	0.002	0.035	0.403	0.811	0.891	0.924
Republic of Korea (1980)	0.001	0.042	0.431	0.813	0.900	0.925
Malaysia (1980)	0.003	0.078	0.363	0.642	0.739	0.832
Philippines (1975)	0.014	0.209	0.543	0.750	0.835	0.862
Taiwan (1980)	0.001	0.034	0.485	0.805	0.898	0.906
Thailand (1970)	0.009	0.176	0.517	0.724	0.814	0.874
Thailand (1980)	0.011	0.170	0.493	0.707	0.809	0.861
Single-headed, male						
Indonesia (1976)	0.007	0.019	0.019	0.017	0.019	0.022
Republic of Korea (1970)	0.025	0.055	0.067	0.021	0.012	0.021
Republic of Korea (1980)	0.013	0.036	0.050	0.021	0.015	0.021
Malaysia (1980)	0.011	0.053	0.050	0.036	0.027	0.034
Philippines (1975)	0.003	0.013	0.021	0.024	0.031	0.043
Taiwan (1980)	0.014	0.043	0.094	0.047	0.031	0.043
Thailand (1970)	0.003	0.013	0.017	0.018	0.022	0.027
Thailand (1980)	0.003	0.014	0.018	0.019	0.021	0.027
Single-headed, female						
Indonesia (1976)	0.002	0.009	0.022	0.051	0.085	0.134
Republic of Korea (1970)	0.007	0.020	0.026	0.045	0.083	0.125
Republic of Korea (1980)	0.010	0.031	0.031	0.050	0.081	0.112
Malaysia (1980)	0.008	0.029	0.038	0.064	0.091	0.120
Phlippines (1975)	0.000	0.004	0.011	0.024	0.040	0.064
Taiwan (1980)	0.011	0.032	0.023	0.026	0.038	0.036
Thailand (1970)	0.003	0.011	0.024	0.040	0.065	0.105
Thailand (1980)	0.004	0.014	0.025	0.043	0.072	0.100

Asian countries, 1970–80

Age								
45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
0.963	0.964	0.946	0.909	0.891	0.841	0.794	0.725	0.626
0.964	0.966	0.950	0.873	0.775	0.604	0.503	0.358	0.307
0.963	0.970	0.958	0.920	0.829	0.704	0.563	0.459	0.385
0.861	0.926	0.881	0.884	0.806	0.801	0.678	0.589	0.504
0.934	0.938	0.931	0.908	0.870	0.796	0.730	0.655	0.525
0.951	0.902	0.805	0.603	0.468	0.334	0.285	0.160	0.159
0.939	0.945	0.940	0.894	0.853	0.769	0.659	0.545	0.465
0.935	0.948	0.950	0.912	0.876	0.790	0.702	0.598	0.524
0.199	0.243	0.288	0.322	0.321	0.333	0.337	0.319	0.220
0.149	0.147	0.121	0.102	0.080	0.053	0.034	0.034	0.023
0.169	0.211	0.228	0.211	0.188	0.155	0.126	0.092	0.078
0.178	0.229	0.270	0.307	0.299	0.306	0.257	0.265	0.239
0.094	0.129	0.154	0.187	0.201	0.222	0.232	0.213	0.166
0.038	0.032	0.042	0.030	0.035	0.037	0.041	0.000	0.000
0.167	0.223	0.267	0.289	0.296	0.304	0.288	0.237	0.185
0.152	0.210	0.260	0.301	0.340	0.330	0.317	0.305	0.254
0.927	0.922	0.900	0.850	0.792	0.738	0.695	0.604	0.485
0.932	0.925	0.896	0.805	0.695	0.523	0.408	0.239	0.216
0.926	0.924	0.904	0.853	0.750	0.608	0.459	0.315	0.220
0.790	0.836	0.774	0.755	0.664	0.633	0.511	0.424	0.389
0.867	0.853	0.832	0.786	0.742	0.657	0.577	0.475	0.373
0.880	0.806	0.681	0.500	0.368	0.256	0.216	0.160	0.053
0.887	0.874	0.847	0.784	0.721	0.601	0.490	0.323	0.301
0.878	0.877	0.850	0.784	0.738	0.621	0.510	0.424	0.363
0.031	0.034	0.035	0.046	0.068	0.073	0.071	0.077	0.129
0.031	0.039	0.052	0.067	0.077	0.079	0.094	0.119	0.080
0.027	0.034	0.043	0.052	0.065	0.080	0.081	0.126	0.144
0.041	0.057	0.063	0.078	0.088	0.104	0.100	0.100	0.054
0.056	0.069	0.079	0.096	0.095	0.099	0.112	0.123	0.116
0.050	0.049	0.052	0.054	0.035	0.039	0.006	0.000	0.000
0.039	0.057	0.077	0.092	0.107	0.137	0.137	0.185	0.134
0.042	0.056	0.080	0.102	0.109	0.140	0.161	0.136	0.116
0.166	0.183	0.207	0.211	0.190	0.184	0.145	0.136	0.088
0.148	0.146	0.120	0.101	0.080	0.053	0.034	0.032	0.023
0.152	0.180	0.177	0.139	0.109	0.082	0.062	0.046	0.027
0.163	0.206	0.227	0.237	0.203	0.193	0.146	0.122	0.109
0.091	0.120	0.139	0.159	0.161	0.169	0.170	0.151	0.116
0.034	0.025	0.025	0.017	0.005	0.010	0.023	0.000	0.000
0.157	0.209	0.240	0.250	0.248	0.248	0.218	0.170	0.113
0.142	0.193	0.234	0.268	0.283	0.263	0.254	0.233	0.199

Appendix A. (*continued*)

Household type and country (year)	15–19	20–24	25–29	30–34	35–39	40–44
One-person, male						
Indonesia (1976)	0.002	0.006	0.008	0.008	0.007	0.006
Republic of Korea (1970)	0.000	0.001	0.001	0.001	0.001	0.001
Republic of Korea (1980)	0.009	0.016	0.023	0.009	0.006	0.006
Malaysia (1980)	0.016	0.054	0.053	0.027	0.027	0.024
Philippines (1975)	0.002	0.005	0.007	0.007	0.008	0.009
Taiwan (1980)	0.000	0.005	0.014	0.007	0.009	0.007
Thailand (1970)	0.003	0.011	0.012	0.010	0.008	0.011
Thailand (1980)	0.003	0.011	0.012	0.011	0.011	0.011
One-person, female						
Indonesia (1976)	0.002	0.003	0.004	0.006	0.010	0.018
Republic of Korea (1970)	0.001	0.001	0.001	0.002	0.002	0.002
Republic of Korea (1980)	0.008	0.022	0.014	0.011	0.010	0.011
Malaysia (1980)	0.006	0.017	0.013	0.008	0.009	0.009
Philippines (1975)	0.000	0.000	0.001	0.001	0.001	0.002
Taiwan (1980)	0.000	0.003	0.003	0.004	0.002	0.003
Thailand (1970)	0.001	0.003	0.004	0.003	0.005	0.005
Thailand (1980)	0.002	0.005	0.006	0.007	0.007	0.007
Primary-individual, male						
Indonesia (1976)	0.001	0.003	0.001	0.001	0.000	0.000
Republic of Korea (1970)	0.000	0.000	0.000	0.000	0.000	0.000
Republic of Korea (1980)	0.010	0.008	0.006	0.001	0.001	0.001
Malaysia (1980)	—	—	—	—	—	—
Philippines (1975)	0.001	0.003	0.003	0.002	0.002	0.001
Taiwan (1980)	0.000	0.000	0.000	0.000	0.000	0.000
Thailand (1970)	0.001	0.003	0.003	0.002	0.002	0.002
Thailand (1980)	0.001	0.005	0.006	0.003	0.003	0.002
Primary-individual, female						
Indonesia (1976)	0.000	0.000	0.000	0.000	0.000	0.001
Republic of Korea (1970)	0.000	0.000	0.000	0.000	0.000	0.000
Republic of Korea (1980)	0.010	0.011	0.004	0.002	0.002	0.001
Malaysia (1980)	—	—	—	—	—	—
Philippines (1975)	0.000	0.000	0.000	0.000	0.000	0.000
Taiwan (1980)	0.000	0.000	0.000	0.000	0.000	0.000
Thailand (1970)	0.000	0.001	0.001	0.001	0.001	0.001
Thailand (1980)	0.001	0.003	0.004	0.001	0.002	0.001

Note: Primary-individual households were not tabulated in the Malaysia census.

Age								
45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
0.004	0.009	0.012	0.013	0.032	0.029	0.028	0.043	0.012
0.002	0.001	0.002	0.001	0.003	0.002	0.002	0.000	0.011
0.008	0.011	0.010	0.014	0.013	0.015	0.023	0.017	0.021
0.031	0.033	0.044	0.051	0.054	0.064	0.068	0.065	0.060
0.010	0.013	0.018	0.024	0.031	0.036	0.036	0.052	0.032
0.021	0.047	0.073	0.048	0.066	0.036	0.063	0.000	0.105
0.012	0.013	0.015	0.017	0.024	0.030	0.032	0.036	0.029
0.012	0.013	0.017	0.025	0.028	0.026	0.031	0.031	0.045
0.033	0.059	0.080	0.108	0.130	0.148	0.192	0.183	0.130
0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.002	0.000
0.016	0.030	0.048	0.069	0.076	0.070	0.063	0.044	0.049
0.015	0.023	0.043	0.070	0.096	0.113	0.112	0.143	0.130
0.003	0.008	0.014	0.025	0.037	0.049	0.054	0.059	0.047
0.004	0.007	0.016	0.014	0.030	0.027	0.018	0.000	0.000
0.009	0.013	0.026	0.038	0.047	0.053	0.066	0.067	0.072
0.010	0.016	0.024	0.031	0.053	0.063	0.061	0.070	0.055
0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
—	—	—	—	—	—	—	—	—
0.001	0.002	0.002	0.002	0.002	0.003	0.004	0.004	0.004
0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.000	0.000
0.001	0.001	0.001	0.001	0.001	0.002	0.000	0.001	0.001
0.002	0.001	0.002	0.001	0.001	0.003	0.000	0.007	0.000
0.000	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.002
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.001	0.002	0.003	0.003	0.003	0.002	0.001	0.001	0.002
—	—	—	—	—	—	—	—	—
0.000	0.001	0.002	0.002	0.003	0.004	0.008	0.003	0.002
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.001	0.001	0.001	0.002	0.001	0.003	0.003	0.001	0.001
0.001	0.001	0.002	0.001	0.004	0.004	0.002	0.001	0.000

APPENDIX B. SUMMARIES OF HOMES PROGRAMS

TOTAL NUMBER OF MEMBERS
PRIMARY INDIVIDUAL HOUSEHOLDS, FEMALE HEADS
FEMALE MEMBERS

AGE GROUP	- AGE OF HEAD - 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	1590.	0.	0.	0.	0.	0.
15-19	0.	0.	0.	54348.	0.	0.	0.	0.	0.
20-24	0.	0.	0.	0.	51594.	0.	0.	0.	0.
25-29	0.	0.	0.	0.	0.	12329.	0.	0.	0.
30-34	0.	0.	0.	0.	0.	0.	31482.	0.	0.
35-39	0.	0.	0.	0.	0.	0.	0.	13209.	0.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	1513.
45-49	0.	0.	0.	0.	0.	0.	0.	0.	0.
50-54	0.	0.	0.	0.	0.	0.	0.	0.	0.
55-59	0.	0.	0.	0.	0.	0.	0.	0.	0.
60-64	0.	0.	0.	0.	0.	0.	0.	0.	0.
65-69	0.	0.	0.	0.	0.	0.	0.	0.	0.
70-74	0.	0.	0.	0.	0.	0.	0.	0.	0.
75-79	0.	0.	0.	0.	0.	0.	0.	0.	0.
80-84	0.	0.	0.	0.	0.	0.	0.	0.	0.
85+	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	55938.	51594.	12329.	31482.	13209.	1513.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10-14	0.	0.	0.	0.	0.	0.	0.	0.	0.	1590.
15-19	0.	0.	0.	0.	0.	0.	0.	0.	0.	54348.
20-24	0.	0.	0.	0.	0.	0.	0.	0.	0.	51594.
25-29	0.	0.	0.	0.	0.	0.	0.	0.	0.	12329.
30-34	0.	0.	0.	0.	0.	0.	0.	0.	0.	31482.
35-39	0.	0.	0.	0.	0.	0.	0.	0.	0.	13209.
40-44	0.	0.	0.	0.	0.	0.	0.	0.	0.	1513.
45-49	1544.	0.	0.	0.	0.	0.	0.	0.	0.	1544.
50-54	0.	1744.	0.	0.	0.	0.	0.	0.	0.	1744.
55-59	0.	0.	2591.	0.	0.	0.	0.	0.	0.	2591.
60-64	0.	0.	0.	4511.	0.	0.	0.	0.	0.	4511.
65-69	0.	0.	0.	0.	4160.	0.	0.	0.	0.	4160.
70-74	0.	0.	0.	0.	0.	3757.	0.	0.	0.	3757.
75-79	0.	0.	0.	0.	0.	0.	1469.	0.	0.	1469.
80-84	0.	0.	0.	0.	0.	0.	817.	137.	0.	954.
85+	0.	0.	0.	0.	0.	0.	0.	0.	1022.	1022.
TOTAL	1544.	1744.	2591.	4511.	4160.	3757.	2286.	137.	1022.	187816.

TOTAL NUMBER OF MEMBERS
ALL HOUSEHOLDS COMBINED
MALE MEMBERS

- AGE OF WIFE OR HEAD -

AGE GROUP	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	5325.	261275.	1042774.	660738.	102082.	4891.
5- 9	0.	0.	0.	116.	13261.	316091.	1058040.	575570.	156183.
10-14	0.	0.	0.	3840.	7029.	18484.	324274.	822053.	480789.
15-19	0.	0.	0.	123661.	78638.	98964.	77438.	265427.	588110.
20-24	0.	0.	0.	13082.	284427.	121058.	71356.	39290.	121091.
25-29	0.	0.	0.	11682.	414561.	794951.	113903.	54095.	35915.
30-34	0.	0.	0.	2392.	158426.	807070.	608510.	41194.	20351.
35-39	0.	0.	0.	127.	13308.	217129.	784165.	421368.	19082.
40-44	0.	0.	0.	53.	1306.	22531.	231739.	602844.	366030.
45-49	0.	0.	0.	348.	1675.	8906.	32816.	165197.	488344.
50-54	0.	0.	0.	2204.	3843.	10320.	16504.	34939.	168163.
55-59	0.	0.	0.	538.	4133.	15095.	8990.	12840.	36337.
60-64	0.	0.	0.	67.	2079.	7823.	7241.	5633.	8697.
65-69	0.	0.	0.	295.	4471.	13236.	15053.	14422.	12141.
70-74	0.	0.	0.	105.	3146.	8427.	12069.	11811.	11931.
75-79	0.	0.	0.	147.	1284.	4124.	5702.	6427.	8936.
80-84	0.	0.	0.	43.	569.	1774.	2781.	3145.	4484.
85+	0.	0.	0.	91.	367.	374.	1128.	857.	1216.
TOTAL	0.	0.	0.	164115.	1253795.	3509131.	4032434.	3179180.	2532685.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	19548.	61246.	58207.	36476.	18909.	6359.	1713.	799.	369.	2280704.
5- 9	6800.	19841.	37590.	31621.	19657.	9121.	2242.	1056.	17.	2247202.
10-14	201593.	75332.	34377.	28197.	21824.	10030.	3180.	1160.	128.	2032285.
15-19	536508.	273099.	114119.	31657.	13959.	7354.	3818.	1699.	507.	2214951.
20-24	349779.	326764.	158161.	64911.	17478.	5595.	3376.	1906.	632.	1578903.
25-29	116495.	284475.	192125.	95636.	36941.	7731.	3836.	1823.	565.	2164730.
30-34	17797.	68942.	87383.	49009.	23605.	7856.	2461.	1268.	367.	1976635.
35-39	1179.	1495.	16630.	16841.	9103.	4622.	1064.	435.	43.	1506582.
40-44	21794.	444.	418.	1021.	1083.	514.	207.	45.	8.	1250030.
45-49	340044.	21692.	4203.	4035.	10493.	8125.	3921.	784.	388.	1090969.
50-54	414405.	307943.	25673.	9969.	5755.	9145.	3628.	1378.	482.	1014352.
55-59	160013.	294037.	199411.	13715.	1964.	1266.	2777.	1500.	500.	753116.
60-64	35743.	116397.	168902.	122786.	11180.	597.	357.	673.	245.	488421.
65-69	12648.	34053.	78743.	89717.	81933.	6737.	274.	67.	202.	364073.
70-74	10612.	11914.	19679.	37066.	41357.	42524.	2909.	64.	0.	213613.
75-79	7992.	5428.	5632.	7997.	13464.	11310.	16604.	672.	60.	95777.
80-84	3683.	3384.	2735.	2574.	2269.	3872.	2614.	8010.	64.	42002.
85+	2169.	2033.	1108.	883.	618.	697.	741.	765.	2772.	15818.
TOTAL	2258798.	1908515.	1205093.	644110.	331592.	143455.	55724.	24103.	7430.	21330112.

TOTAL NUMBER OF MEMBERS
ALL HOUSEHOLDS COMBINED
FEMALE MEMBERS

AGE GROUP	- AGE OF WIFE OR HEAD -								
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
0- 4	0.	0.	0.	4757.	249948.	996607.	593406.	90871.	4580.
5- 9	0.	0.	0.	153.	12625.	296245.	994394.	522917.	144127.
10-14	0.	0.	0.	4481.	6041.	18522.	297143.	761742.	443936.
15-19	0.	0.	0.	131792.	72288.	90601.	70144.	237702.	528253.
20-24	0.	0.	0.	4079.	836922.	78922.	51338.	31012.	102510.
25-29	0.	0.	0.	187.	2655.	1708242.	9061.	5394.	4333.
30-34	0.	0.	0.	531.	5755.	19215.	1729880.	24060.	14909.
35-39	0.	0.	0.	516.	2321.	4615.	8040.	1352749.	6343.
40-44	0.	0.	0.	0.	0.	3.	3.	0.	1168882.
45-49	0.	0.	0.	0.	1.	0.	0.	0.	0.
50-54	0.	0.	0.	2239.	32458.	62478.	20185.	1172.	323.
55-59	0.	0.	0.	2065.	30854.	87791.	68310.	21889.	1534.
60-64	0.	0.	0.	1813.	21050.	72285.	85775.	61953.	27242.
65-69	0.	0.	0.	1454.	13143.	48767.	68341.	72071.	62100.
70-74	0.	0.	0.	123.	5263.	20223.	47486.	51831.	59994.
75-79	0.	0.	0.	98.	1637.	9213.	17751.	21828.	31645.
80-84	0.	0.	0.	49.	1423.	4203.	6702.	9367.	15232.
85+	0.	0.	0.	43.	854.	3156.	4366.	2849.	4893.
TOTAL	0.	0.	0.	154381.	1295237.	3521084.	4072325.	3269403.	2620834.

AGE GROUP	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
0- 4	17295.	52762.	49431.	31831.	16244.	5633.	1634.	790.	120.	2115903.
5- 9	5921.	15962.	29688.	26137.	15675.	7322.	1566.	645.	38.	2073413.
10-14	186100.	72484.	33428.	27614.	18329.	8770.	2816.	1031.	164.	1882596.
15-19	480499.	246130.	108450.	30785.	11226.	5620.	3395.	2000.	336.	2019218.
20-24	333874.	348236.	166547.	69681.	19318.	5504.	3302.	1456.	423.	2053118.
25-29	35543.	141900.	109337.	58030.	25659.	7267.	2456.	1146.	621.	2111831.
30-34	13426.	31454.	50736.	36545.	21334.	9792.	2104.	1044.	72.	1960855.
35-39	5926.	4213.	13005.	21330.	17369.	8764.	3652.	932.	257.	1450031.
40-44	13.	4.	41.	414.	837.	583.	283.	67.	26.	1171156.
45-49	1074213.	4.	1.	5.	33.	54.	33.	13.	6.	1074362.
50-54	217.	894487.	53.	239.	824.	2731.	4689.	2450.	601.	1025146.
55-59	149.	229.	630128.	150.	65.	226.	2410.	1866.	1055.	848721.
60-64	3012.	1003.	1079.	383358.	224.	314.	270.	628.	201.	660207.
65-69	28566.	3995.	738.	711.	224879.	199.	65.	279.	68.	525376.
70-74	47579.	20070.	2507.	859.	128.	105574.	118.	58.	121.	361936.
75-79	42021.	32133.	12398.	1734.	151.	397.	41813.	169.	0.	212988.
80-84	20024.	24196.	15242.	5782.	1164.	272.	817.	14637.	0.	119111.
85+	7366.	9980.	9648.	4311.	2841.	648.	69.	249.	5730.	57010.
TOTAL	2301741.	1899242.	1232454.	699515.	376300.	169673.	71496.	29460.	9838.	21722928.

Program: HOMES.CNTL

Objective: Project the number and demographic characteristics of households.

Input:
User provided
- country.POP.DATA
- country.FERT.DATA

Stage 1 output
- country.R1.DATA
- country.R2.DATA
- country.R3.DATA
- country.R4.DATA
- country.R5.DATA
- country.K.DATA
- country.IGW.DATA
- country.CIV.DATA

Source program
- HHPART2B.FORT

Output:
country.N1.DATA
country.N2.DATA
country.NT.DATA

Execution:

1. Edit/create country.POP.DATA, country.FERT.DATA, and country.CIV.DATA. (For specifications, see section 4.)
2. Edit HOMES.CNTL to specify proper input and output files.
3. Submit HOMES.CNTL

Programs: DSET1.CNTL
DSET2.CNTL
DSETT.CNTL

Objective: Uses output from HOMES projections to create SAS partitioned data sets used for secondary analysis, such as generating summary tables and graphs.

Input: country.N1.DATA
country.N2.DATA
country.NT.DATA

Output: country.N1.SAS(Yyear)
country.N2.SAS(Yyear)
country.NT.SAS(Yyear)

year = 1st projection year, . . ., last projection year

Execution:

1. Edit DSETi.CNTL to specify proper input and output files.

2. Specify the first and last projection years in the statements "%LET START = startyr;" and "%LET END = endyr;".

3. Submit the program.

Program: REPORT1.CNTL

Objective: Produces summary tables of household projections for selected years. User allowed to select among nine summary tables.

Input: country.N1.SAS(Yyear)
country.N2.SAS(Yyear)
country.NT.SAS(Yyear)

Input files are generated by DSETi.CNTL.

Output: Table 1. Number of heads and spouses
Table 2. Number of children
Table 3. Number of parents
Table 4. Number of grandchildren
Table 5. Number of others
Table 6. Total number of members
Table 7. Age of members by type of household
Table 8. Age of members by age of head
Table 9. Relationship to head by age of head

Execution:

1. Create SAS data sets using DSETi.CNTL.
2. Edit REPORT1.CNTL, change input and output file names.
3. Specify the name of country and the year of the report in "%LET COUNTRY = country" and "%LET YEAR = year".
4. Select the tables to be printed (see table numbers above) in the statement "%LET TABLENO = %STR(. . .);".
5. Specify the number of tables selected in the statement "%LET TABCNT = . .;".
6. Submit the program.

Comment: Summary tables presented in section 1 for the Republic of Korea were generated using these procedures.

Program:	REPORT2.CNTL
Objective:	Produces detailed summary tables of household projections for selected years. User allowed to select among six summary tables.
Input:	country.N1.SAS(Yyear) country.N2.SAS(Yyear) country.NT.SAS(Yyear) Input files are generated by DSETi.CNTL.
Output:	Table 1. Number of heads and spouses Table 2. Number of children Table 3. Number of parents Table 4. Number of grandchildren Table 5. Number of others Table 6. Total number of members
Execution:	1. Create SAS data sets using DSETi.CNTL. 2. Edit REPORT2.CNTL, change input and output file names. 3. Specify the name of country and the year of the report in "%LET COUNTRY = country" and "%LET YEAR = year". 4. Select the tables to be printed (see table numbers above) in the statement "%LET TABLENO = %STR(. . .);". 5. Specify the number of tables selected in the statement "%LET TABCNT = . .;". 6. Submit the program.
Comment:	This program generates tables with more age detail than in REPORT1.CNTL.

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and Peter Xenos

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CONTENTS

Preface *vii*

Abstract *1*

Background *1*
  The status of women *2*
  Hypotheses *5*
  Fertility over the life course *6*

Data *7*

Sample characteristics *9*
  Marriage arrangements *9*
  Women's status *11*
  Human capital and economic activity *12*
  Family socioeconomic status *14*

Methods *15*

Results *18*
  The third-parity progression *18*
  MCA models of fertility *19*
  Proportional hazards models *22*

Conclusions *24*

References *27*

FIGURES AND TABLES

Figures

1. Hazard rate of third-parity progression among Thai women, by ethnicity and residence *15*
2. Proportion of Thai women having a third birth, by ethnicity and residence *16*

Tables

1. Marriage arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity *10*
2. Intrafamilial power arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity *11*
3. Human capital and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity *13*
4. Family economic status and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity *20*
5. Multiple classification analysis of the number of third and higher-order births among Thai women, by residence and ethnicity *21*
6. Proportional hazards model of the third-birth rate among ethnic Thai women, by period *23*

PREFACE

This research was supported by a grant from the Rockefeller Foundation's Research Program on Women's Status and Fertility. Any opinions, findings, conclusions, or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of the Rockefeller Foundation. We thank Mary Brinton, Karen Mason, William Parish, and Herbert Smith for helpful comments on earlier drafts of this paper.

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ABSTRACT This study investigates the effects of three aspects of women's status on the fertility of Thai women. These include marriage arrangements, patterns of intrafamilial decision making, and women's human capital skills and economic activities. The analysis is based on data collected in the 1979 Asian Marriage Survey in Thailand. A multiple classification analysis is used to investigate fertility beyond the second birth. Survival tables and multivariate proportional hazards models are used to study differentials in the rate at which women with two children have a third birth. We test the hypotheses that the effects of these women's status variables on fertility are (1) greater in an urban setting than in a rural setting, and (2) increased after the Thai reproductive revolution. We identify cultural differences in fertility decisions between ethnic Thais (who have a bilateral kinship system with uxorilocal residence) and Thai-Chinese (who have a patrilineal, virilocal kinship system).

BACKGROUND

The United Nations (1984, 1985) has estimated that between 1960-65 and 1980-85 Thailand experienced a 44 percent decline in its fertility rate, with the total fertility rate declining from 6.4 to 3.6 children per woman. This fertility decline is among the most rapid ever recorded for a population and was achieved primarily by means of increased contraception (Knodel, Chamratrithirong, and Debavalya 1987). By 1984, 65 percent of currently married women of ages 15-44 were practicing contraception and nearly all of these (96 percent) were using an effective method (Kamnuansilpa and Chamratrithirong 1985).

This rapid change in Thai reproductive behavior has been characterized aptly by demographers who have documented this fertility transition as a "reproductive revolution" (Knodel, Chamratrithirong, and Debavalya 1987). These researchers have suggested that four factors combined to produce the fertility transition: (1) rapid and fundamental social changes that increased the perceived costs of children; (2) a latent demand for effective fertility control for at least a generation before the fertility transition began; (3) the unique receptivity of Thais to deliberate fertility regulation as an innovative adaptation to changing social circumstances, which is associated with the relatively high degree of female autonomy, the locus of reproductive decision making with the couple rather than larger kin group, and the Theravada Buddhist emphasis on individual responsibility; and (4) the effectiveness of organized efforts to increase awareness of and accessibility to effective and acceptable means of fertility regulation. The finely textured community studies by Lauro (1979) and Podhisita (1985) provide considerable supporting evidence for this account.

Although the combination of these variables, unique to contemporary Thailand, seemingly has produced an unusually rapid decline in fertility, the components of this explanation reflect more general ideas about the causes of fertility declines (Coale 1973; United Nations, Department of Economic and Social Affairs 1973; Bulatao and Lee 1983). Such features of social development as the shift in the family economy from a subsistence to a market orientation and the introduction of secular, state-sponsored compulsory education have increased both the direct and the opportunity costs of children, thereby lowering fertility demand (Caldwell 1982; Oppong and Haavio-Mannila 1979; Hogan and Frenzen 1981). The mortality declines associated with modernization, meanwhile, have increased the supply of surviving children. Organized family planning programs appear effective in helping to diffuse modern methods of contraception, facilitating the new effort toward family-size limitation (Mauldin 1983; Retherford and Palmore 1983; Chamratrithirong, Morgan, and Rindfuss 1985).

The status of women

In recent years it has become apparent that little variance in the fertility behavior of individuals is accounted for by standard socioeconomic variables. At the population level, measures of social and economic development have proven inadequate as explanations for fertility reduction through family-size limitation (Van de Walle and Knodel 1980). Meanwhile, demographers trained in the social sciences have been attracted increasingly to contextual explanations of behavior over the life course. Cultural influences on reproductive behavior; historical, social, and institutional arrangements; and age and gender stratification are elements of these contextual explanations (Elder 1978).

Demographers have become increasingly aware of the possible effects of the varying roles and status of women as causes of fertility decline (Mason 1983). Prominent features of women's status that are recurrently mentioned include marriage circumstances, patterns of intrafamilial decision making, and women's human capital skills and economic activities.

Normative beliefs about family-building behavior are first acquired in childhood through family socialization. In societies where children are of considerable economic value to their parents, there typically are normative supports for large families (Caldwell 1982). Such norms are particularly strong in patrilineal societies in which son preference is strong and women depend on their sons for support in old age (Cain 1984). Families may be able to enforce conformity to high fertility norms through parental control of mate selection, marriage arrangements, and the control of material resources through dowry payments and inheritance patterns. Such control probably is more effective in situations in which the couple lives with the husband's family. Such patterns are very common in South Asia and among traditional Chinese, including Thai-Chinese.

The situation is quite different for ethnic Thais among whom the family is organized on the basis of bilateral kinship and inheritance and there is relatively little interest in family genealogy. Marriage is mainly by personal choice, with some preference that the spouse be ethnic Thai and that the families be of more or less equal economic status (Foster 1975; Lauro 1979; Kaufman 1960; Smith 1973; Wijeyewardene 1967).

Foster (1975) has constructed a folk model of the traditional Thai household developmental cycle based on the following residence rules: (1) after a young couple marry, they live with the wife's family (this allows them to save resources for their own household); (2) the couple stays with the wife's parents until their next daughter marries and brings her spouse into the household—then the older couple leaves to establish an independent household; and (3) when the youngest daughter marries, she and her husband stay permanently to care for her parents and inherit the house.

However, the extent to which individuals adhere to these norms of behavior in their own residential decisions varies. Thailand has been characterized as having a "loosely structured" sociocultural system in which individuals exercise a substantial degree of latitude in their conformity to norms (Embree 1950). Although this notion of a loosely structured society has engendered much controversy, evidence from the 1979 Asian Marriage Survey in Thailand demonstrates more diversity in marital experiences than strict adherence to agreed-on patterns of behavior would have permitted (Chamratrithirong 1983).

Foster (1975) suggests, on the basis of his anthropological study of two rural villages in central Thailand, that the traditional residential rules are generally followed with the exception that more sons live with parents than expected. Moreover, with the increasing movement of young people from the villages, it is less necessary for children to spend time with their parents to accumulate resources (since they typically enter nonagricultural employment), so that all children have about an equal chance to remain in the household. This deviation from the traditional pattern may result from recent population pressures on land and the related fragmentation of holdings, as well as the competing opportunites found in Bangkok and elsewhere.

These aspects of the Thai family system may enhance the position of the wife as she works out the patterns of family decision making and the roles and responsibilities that will characterize her marriage. This feature of Thai society has often been noted as one reason for its especially rapid fertility reduction (Knodel, Chamratrithirong, and Debavalya 1987).

Cultural norms about husband and wife roles and their implications for family-building behavior can also reflect influences from outside the family. Greater individual autonomy and more equal female roles are characteristic of the Theravada Buddhism practiced by most Thais, whereas Islam appears to reinforce male dominance (Knodel, Chamratrithirong, and Debavalya 1987).[1] The mass media and formal schooling may enhance personal modernity, promoting the adoption of a small family size (Fawcett and Bornstein 1973). Caldwell (1982) has argued that the introduction of formal education into a population establishes the idea of extrafamilial sources of authority, reduces the value and increases the costs of children, and enhances the decision-making power of women of reproductive age within the family. Although various factors have been identified as ultimate causes of greater female equality within the family (e.g., Oppong and Church 1981), the feature of immediate relevance is the extent to which females make or influence decisions that affect the allocation of family resources, including time devoted to work roles in the home (Mason 1983).

Economic theories have directed attention to the importance of female education and training in job skills as forms of human capital investment that increase the potential wages a woman can earn, thereby increasing the opportunity costs associated with childbearing and childrearing (Easterlin 1978; Birdsall 1977). Women who capitalize on such human capital by becoming gainfully employed in the labor force, especially those with more skilled and better-paying jobs, experience opportunities that compete with traditional wife and mother roles (Oppong and Haavio-Mannila 1979; Cochrane 1979). Such competing roles also give women greater access to extrafamilial sources of information and resources, increasing their potential autonomy in reproductive decision making (Caldwell 1982) and improving their ability to prevent unwanted births through knowledge of effective contraceptives.

However, Mason and Palan (1981) point out that such effects are not uniform. Acceptable childcare arrangements and the location and nature of work activities determine the extent to which work is compatible or incompatible with childbearing. Opportunity structures for household economic accumulation are important in this regard, with their effects depending on the importance of wage labor and the potential economic contributions of mothers and children.

Available evidence suggests that the social and family context affects the ability of women to earn substantial returns to their skills and schooling. Returns to human capital are greater in social environments with a more diversified labor force and differentiated wage structure, typically cities (Cochrane 1983). Female roles within the family and the degree of sex-role

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1. This argument suggests that religion has its major effects on fertility through cultural norms that regulate appropriate age and gender roles. We believe that specific religious doctrines on fertility and contraceptive practice have minor influences because they are frequently contradictory, often misunderstood, and, in any event, widely ignored (as, for example, with views toward abortion among Thai Buddhists).

equality between spouses also is of importance, insofar as many occupations require women to work outside of the household and are not compatible with childcare.

These explanations of fertility decline implicitly assume that the number of children a couple has is the result of a decision-making process. In the simplest scenario, the costs and benefits of an additional child are determined, and the couple will continue having additional children until the net value of another child is negative, at which time they will limit their fertility.

However, evidence from the demographic history of Europe and selected Asian nations (including Thailand) shows that fertility regulation in a population need not appear in response to social and economic changes that alter the net value of children. In many populations it appears that the critical factor is the recognition by couples that family size is subject to rational decision making and control (Coale 1973; Van de Walle and Knodel 1980; Knodel, Chamratrithirong, and Debavalya 1987). This perspective suggests that fertility behavior is influenced by rational planning considerations, including attention to the costs and benefits of children, only after couples recognize that fertility limitation is possible. If this explanation of the fertility decline in Thailand is valid, we would expect to find evidence of limited effects of women's status variables on fertility prior to the Thai reproductive revolution, and a rather large impact afterward.

Hypotheses

On the basis of this prior research, we formulated the following hypotheses.

1. Traditional Thai marriage forms consisting of individual selection of spouse with parental consent, a formal marriage ceremony, a brideprice, and uxorilocal postnuptial residence are conducive to limitation of family size. We expect, therefore, to find an association between marriage form and family size among ethnic Thais who differ in their adherence to these marriage patterns, as well as between ethnic Thais and the Thai–Chinese.

2. Women with greater individual autonomy and power in family decision making are more likely to limit their family size than are couples in which the male is dominant. This hypothesis assumes that because women experience the increased opportunity costs of childbearing more directly than their husbands, they are more inclined to favor fertility reduction. This premise seems soundly based in Thailand (Shevasunt and Hogan 1979) but need not apply in all societies (Mason 1983).

3. Women who are more educated, who are in the paid labor force, and who hold higher-status, better-paying jobs have lower fertility than other women. We expect these effects to be greatest among urban residents because of the more differentiated economic opportunity structure of the city.

4. Women with greater individual autonomy and power in the family are especially able to earn a return on human capital investments, and therefore they are more likely to limit their family size.

5. The effects of these women's status variables on fertility were minimal prior to the reproductive revolution in Thailand. By 1970, family size was within the calculus of rational decision making, and the effects of women's status variables on fertility increased substantially.

Fertility over the life course

It is useful to view the family-building behavior of women as continually evolving over their life course as they age in changing social environments (Elder 1974, 1978; Featherman 1982).[2] These social environments are demarcated by the experiences and opportunities associated with power and access to economic resources in the community, within the coresidential family, and among extended kin. To understand fertility decisions, it is necessary to consider historical changes in the social environment and the ways in which social environments vary across the life cycle (Mason 1983). Thus, to understand why a couple has an additional birth or limits their fertility, it is necessary to study the situation of that couple at the time they were assessing the desirability of another child and deciding whether to practice contraception (Ryder 1975; Namboodiri 1972).

Research on Thai fertility has repeatedly demonstrated that most Thais desire at least two children, and there is no evidence of a move toward childlessness or a one-child family even among the most recent marriage cohorts. The 1984 Contraceptive Prevalence Survey indicates that only 7 percent of rural women and 10 percent of urban women who had married in the preceding five years wanted fewer than two children. The modal family size desired was two children (56 percent of rural and 61 percent of urban women). About one-quarter of both the urban and rural women desired three children, and only about one in ten preferred four or more children. Behavioral data indicate that very few women voluntarily have fewer than two children.

Thus, the key family-building decision point for Thai couples comes after the birth of the second child with the decision to limit the family size to two children or to have a third child. Couples then sequentially decide about higher parity births, and these decisions jointly determine the number of additional children a couple has beyond the minimal two-child target. In this paper we focus on these critical fertility decisions.[3]

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[2] Focus group discussions with Thai men and women of different ages show that older men and women are quite conscious of the changing social and economic situations in which they made their fertility decisions. These changing circumstances frequently are pointed to as the reasons why they practiced contraception to limit their family size (Knodel, Chamratrithirong, and Debavalya 1987).

DATA

This project uses data from a detailed longitudinal survey of representative population samples of Thai women of reproductive age from rural and urban areas of central Thailand. The Asian Marriage Survey in Thailand (AMS) was conducted during December 1978 and April 1979. The data were collected through personal interviews by carefully trained female interviewers. The AMS collected extensive social, economic, and demographic data on women of reproductive age, their parents and siblings, their husbands, and other members of the coresidential household. The AMS asked detailed questions on the normative values pertaining to marriage and childbearing and on the origins of those values, and it measured the extent to which those values were adhered to in actual behavior. Most important for this study, the AMS collected complete retrospective event history data from the respondents about their education, residence, labor force participation and occupation, marriage, and fertility experiences over their life span. The event histories record every status, change of status, and dates of changes in each of these life domains (Smith and Chapon 1978; Chapon 1979). The AMS also interviewed the husbands of the female respondents. These data are not used in this analysis.

One must exercise caution in the analysis of retrospective data owing to occasional failure to recall events or incorrect dating of those events (Potter 1977). Nevertheless, such longitudinal data are essential for a careful life-course analysis of demographic behavior (Featherman 1980). Research on response reliability suggests that Thai respondents are at least as accurate as American respondents in providing basic demographic information (Knodel and Piampiti 1977). Furthermore, the AMS used rigorous methods to train and closely supervise the eight interviewers. Field experience demonstrated that the life-history matrix (which facilitates comparisons of activities across life domains at each age) was an effective method for helping respondents recollect their life histories. This claim is supported by tabulations of the AMS event history data that indicate the histories are virtually complete for most respondents and provide no evidence of age heaping or other systematic biases at the aggregate level.

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[3] We attempted to use a retrospective question on ideal family size to determine whether additional births beyond the second were wanted or unwanted. This analysis did not produce meaningful results, presumably because of the obvious difficulties involved in the use of such a crude and unreliable indicator of prior fertility intentions (Knodel and Piampiti 1977). We therefore restrict our analysis to differentials in recorded fertility behaviors.

The rural sample was drawn from a group of three adjacent *tambol*, geographically and socially defined as one community, located near the center of Viseschaichan District, Angthong Province, approximately 70 kilometers from Bangkok. This community included nineteen villages with a total of approximately 2,238 households. Fourteen of the villages were selected for inclusion in the study. An attempt was made to interview all ever-married women of ages 15–44. Altogether, 657 ever-married women in these villages were finally interviewed.

The urban sample was based on the Master Sample of the Bangkok Metropolis, which was developed by the Department of Applied Statistics, National Institute of Development Administration, in 1978 (Suwatti and Saisaengchan 1978). This sample consists of 200 randomly selected blocks, representing more than 6,000 blocks of 24 administrative divisions in the Bangkok Metropolis. From the 200 blocks in the Master Sample, 24 blocks were randomly selected for inclusion in the AMS. Within these 24 blocks, interviews were conducted with all ever-married women between ages 15 and 44, producing a total of 515 interviews.

The AMS included a third sample stratum representing urban squatters not resident in the established areas of the Bangkok Metropolis. This sample was drawn by interviewing all ever-married 15–44-year-old women resident in eighteen of fifty-seven blocks in the Slum Klong Toey, yielding completed interviews with 507 women. We have not included this slum population in our analysis of urban Thai behavior because of its extreme social, economic, and residential heterogeneity. For this analysis, however, we have combined data for the Thai–Chinese living in this slum with that of other urban Thai–Chinese interviewed in the AMS. This was done to increase the sample size for this group. Exploratory tabulations indicated that rate of the third-parity progression among the Thai–Chinese did not differ significantly between the two sample strata.

To avoid an overrepresentation of early marriers in our urban and rural samples, we have restricted this study to women of ages 26 and older (an age by which 90 percent of Thai women marry). The analysis is based on currently married women with both the husband and wife in their first marriage to avoid fertility differentials arising from complex marital histories. Because we are interested in fertility beyond the second birth, we have restricted our attention to women who had at least two children, with the second birth occurring between 1960 and 1976. The urban population included only those women who were already resident in Bangkok by the date of their second birth. These restrictions result in an analysis sample of 287 rural women (all ethnic Thai) and 202 urban women (of whom 126 were ethnic Thai and 76 were Thai–Chinese).[4]

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[4] There is no agreed-upon definition of Chinese ethnicity in Thailand. We have classified as Thai–Chinese a woman who was an urban resident if either her mother or

SAMPLE CHARACTERISTICS

We begin by describing the characteristics of these mothers with two children on various dimensions of women's status, including their marriage arrangements, patterns of intrafamilial decision making, and human capital skills and economic activities. We also compare the rural and urban Thais and the Thai–Chinese to determine differences between them in the status of women who had two children and were deciding whether to have a third. The social status and modernity of the women's family, taking into account the husband's characteristics, are also described.

Marriage arrangements

A Thai woman has a major role in the selection of her spouse (Table 1). More than four-fifths of the rural and urban women sampled had a period of courtship with their husbands prior to marriage. Sixty-nine percent of the rural women and 79 percent of the urban Thais selected their spouses. Courtship was less common among the Thai–Chinese (64 percent), and only 41 percent of the Thai–Chinese women acted alone in selecting their husbands.

Relatively few of these women married prior to age 18 in any of the strata, although such marriages do exist (Table 1). Rural women marry somewhat earlier than urban women, with the latter being somewhat more likely to delay marriage until age 23 or later. The Thai–Chinese displayed less variability in age at marriage, with 47 percent marrying at ages 20–22, and their average age at marriage was intermediate between that of the rural and urban Thais.

Roughly one-fourth of the brides were of higher status than their husbands and another one-fourth were from lower-status families, displaying only modest differences between the groups (Table 1). The traditional brideprice was more common among rural than among urban Thais (60 percent versus 44 percent). A brideprice was paid in 37 percent of the weddings of the Thai–Chinese. In short, although the payment of a brideprice is the norm in rural areas, it is not so common in the urban areas, and all groups display considerable flexibility in the payment of the brideprice.

Three-quarters of the rural women married men from their own villages (Table 1; coded from husbands' and wives' responses regarding whether they changed their village of residence at the time of marriage). Only 40 percent of the urban Thais and 23 percent of the Thai–Chinese married men from the same village as their family. After marriage, nearly

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father was born in China or if her marriage ceremony included Chinese rituals. An inspection of persons so classified suggests that these procedures correctly identified a group of women who themselves were of Chinese ethnicity or were married to a Thai–Chinese husband.

Table 1. Marriage arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai–Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Courtship before marriage						
Yes	82.6	58.6	80.6	56.7	64.1	66.5
No	17.4	60.0	19.4	56.6	35.9	76.5
Role in spouse selection						
Bride alone	69.3	59.8	79.1	59.8	41.0	69.1
Parents or others	30.7	56.8	20.9	45.0	59.0	70.5
Age at marriage				**		
17 or younger	12.9	59.5	10.9	71.4	5.1	50.0
18–19	26.8	59.9	19.4	68.8	12.8	80.0
20–22	32.1	63.0	27.9	56.0	47.4	73.9
23 or older	28.2	52.6	41.9	47.6	34.6	63.6
Brideprice		**				
Yes	59.6	55.7	44.2	59.1	37.2	75.9
No	40.4	63.5	55.8	54.7	62.8	66.2
Marriage form		***		**		
Traditional or formal	69.3	54.5	69.8	53.2	94.9	72.2
Elopement or living together	30.7	68.9	30.2	64.5	5.1	25.0
Relative status of bride				**		
Bride higher	27.3	59.3	22.1	53.8	18.3	46.2
Equal	46.5	57.1	52.5	37.3	54.9	67.2
Groom higher	26.2	59.2	25.4	78.3	26.8	89.3
Village endogamy						**
Yes	75.3	56.8	40.3	52.7	23.1	90.5
No	24.7	65.0	59.7	59.3	76.9	63.9
Residence after marriage		***				
Uxorilocal	48.8	58.9	17.3	56.2	9.0	85.7
Virilocal	17.8	72.6	24.4	61.3	46.2	72.7
Neolocal	33.4	51.5	58.3	56.5	44.9	63.3

* $p < .15$.

** $p < .10$.

*** $p < .05$.

half of the rural women lived uxorilocally, that is, near their parental family. Uxorilocal residence was much less common among the urban Thais (17 percent) and rare among the Thai–Chinese (9 percent). The Thai–Chinese were about equally likely to live virilocally (near the husband's family) or neolocally (in a new location away from both families) after marriage, whereas ethnic Thais not living near the brides' parents most commonly lived neolocally (see also Limanonda 1979; Chamratrithirong, Morgan, and Rindfuss 1985).

Women's status

Comparisons of the educational level of the husband and wife is one common indicator of the relative status of each (Mason 1983). In the urban population, husbands tended to have higher educational levels than their wives (60 percent of the Thais and 52 percent of the Thai–Chinese; see Table 2). The relative education of rural husbands and wives was typically equal (with each having four years of schooling). Only 28 percent of the rural men had higher educations than their wives.

This analysis includes two direct measures of the power of the female to make decisions that affect the allocation of family resources, including

Table 2. Intrafamilial power arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai–Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Relative educational level of spouses						
Husband greater	28.2	52.4	60.3	52.6	52.0	78.5
Wife equal or greater	71.8	62.0	39.7	61.5	48.0	64.2
Equality of roles		*				
Low	55.7	56.2	48.8	63.8	64.1	72.6
High	44.3	62.3	52.4	49.4	36.0	65.2
Wife's involvement in decisions						**
Low	59.2	58.7	57.9	61.0	58.4	65.3
High	40.8	59.2	42.1	53.8	41.6	75.3

* $p < .15$.

** $p < .10$.

*** $p < .05$.

time devoted to work roles in the home.[5] The first of these is an index of sex-role equality based on the sum of three variables, which each measure (on a five-point scale) the extent to which the wife disagrees with statements that work should be strongly sex-typed, that the wife should not expect the husband to help around the house, and that it is acceptable for men to go out alone as often as they want. The second of these direct measures is an index of wife's involvement in decision making based on the sum of three variables, which each measure on a five-point scale the extent to which the husband or wife decides which couples to see most often, about the purchase of major household items, and how much money the family can spend on food. The index includes a fourth variable that measures the extent to which the wife disagrees with the statement that the husband should make important family decisions.

The high degree of female involvement in family decision making among ethnic Thais is apparent in these data (Table 2). Fifty-two percent of urban Thais and 44 percent of the rural Thais sampled revealed a high degree of sex-role equality (scores of 8–15), compared with only 36 percent of the Thai–Chinese. The higher degree of sex-role equality among urban Thais is not translated into a greater involvement of the wife in family decisions, however, with about 42 percent of each of the groups classified as highly involved (scores of 13–20) in family decisions.[6]

Human capital and economic activity

The AMS includes data on the wife's occupational experiences at key points in her married life, and this analysis includes a measure of the educational attainment and occupational activity of the wife at the beginning of the third parity interval (Table 3). Most Thais of reproductive age have four years

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[5] The variables forming these indexes were ascertained with reference to the date of the 1979 survey. They may provide an inaccurate indicator of these variables during the third-parity interval if they have changed over time. These measures may yield biased results for the effects of women's roles on fertility to the extent that these roles are reciprocally affected by the fertility behavior of the couple. We think that the effects of fertility on intrafamilial power arrangements are probably greatest at the time of the first birth. We believe that reciprocal effects are unlikely to be a problem in this analysis as we are dealing with women who have already had at least two children. If the fertility effects on the wife's power are cumulative with cumulative fertility, however, then the problem may be serious. This is an important issue for all analyses of cross-sectional data sets and calls for careful evaluation as more appropriate data become available.

[6] Comparison of these data with AMS data from rural Indonesia and the Philippines suggests that Filipino (Central Luzon) women in these samples had greater sex-role equality (only 27 percent with low scores) and involvement in decision making (only 31 percent with low scores). In the Indonesia (Java) samples, sex-role equality as measured here was very high (only 5.2 percent had low scores), whereas actual decision-making involvement was somewhat below the Thai level (63 percent with a low score).

Table 3. Human capital and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai–Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Education at second birth						**
0–4 years	85.0	60.2	81.4	56.2	87.2	76.0
5 or more years	15.0	51.2	18.6	58.8	12.8	30.0
Occupation at second birth						
Housework	17.8	59.1	36.4	66.9	59.0	70.3
Small trade or unskilled farm	71.0	61.4	22.5	52.7	7.7	66.7
Skilled or white-collar	11.2	41.0	41.1	49.7	33.3	70.1
Wage work before marriage						***
No	72.1	59.7	47.3	59.6	61.5	77.8
Yes	27.9	56.8	52.7	54.0	38.5	57.3
Wage work after marriage				**		**
No	72.5	59.5	54.3	63.6	70.5	75.3
Yes	27.5	57.3	45.7	48.3	29.5	57.0
Opinion of work after marriage						*
Favorable	62.7	60.5	48.7	53.8	39.7	69.2
All right if necessary	23.7	60.3	23.3	64.2	33.3	73.1
Unfavorable	14.6	48.8	27.9	53.8	26.9	67.4

* $p < .15$.

** $p < .10$.

*** $p < .05$.

of formal schooling, and relatively few women have higher levels of education regardless of social setting. There was remarkably little population variability in measures of formal and informal vocational training. This pattern in the survey sample is consistent with national distributions in the census of 1980. Only 27 percent of the rural women worked for wages before or after marriage. The urban women married at later ages and had greater opportunities to work at paid jobs (53 percent before marriage and 46 percent after marriage). Despite their relatively late marriages and the wage employment opportunities in Bangkok, only 39 percent of the Thai-Chinese worked for wages before marriage and 30 percent did so after marriage.

The lower rate at which rural women did wage work before or after marriage was a result of the limited opportunities for such labor in their agricultural villages, rather than a reflection of their opposition to such labor

(Table 3). In fact, two-thirds of the rural women favored work after marriage, compared with half of the urban Thais and only 40 percent of the Thai-Chinese. Some 82 percent of rural Thais were gainfully employed after the birth of their second child. By way of contrast, 63 percent of urban Thais and 41 percent of the Thai-Chinese were in the labor force after their second birth. Most rural women (71 percent) were employed at agricultural jobs, unskilled tasks, or small trade. Of those urban women who worked, most were employed at skilled or white-collar jobs. Thus, relatively high proportions, overall, of the urban Thais (42 percent) and Thai-Chinese (33 percent) were employed at skilled, clerical, and white-collar jobs. Additional measures of human capital investment (wage work before and after marriage), work commitment (whether the woman ever stopped work for a reason related to her family), and respondents' attitudes about women working after marriage proved not to have consistent effects on the fertility of rural women (Hogan, Chamratrithirong, and Smith 1985). Exploratory tabulations provided similar findings for the urban residents.

To summarize these results, for rural women work outside of the home is compatible with childbearing activities. Most rural women work outside of the home, even after they bear a child. But this labor is most frequently unpaid work in a family enterprise, and few rural women have had experiences earning wages. Urban Thais are much more likely to have worked for pay prior to becoming mothers. The majority work outside the home after their second child is born, but many of these women have reservations about wives working. When these mothers do work, they are likely to be employed at better-paying jobs. For these women, there may be substantial opportunity costs associated with the birth of another child. The Thai-Chinese have fewer human capital investments, and most are already housewives. They would face relatively limited opportunity costs from the birth of a third child.

Family socioeconomic status

To control for the effects of family socioeconomic status on fertility, this analysis includes data on the husband's occupation and a measure of overall family socioeconomic status based on the number of modern goods (watch or clock, bicycle, radio, sewing machine, electrical appliances, etc.) in the household. About one-third of the rural men were farmers, but an equal number worked at various skilled craft and manual occupations. The husbands of the urban Thais most commonly were employed at skilled manual jobs, though fully one-third were white-collar workers. The Thai-Chinese husbands had very high status, with 69 percent employed at white-collar occupations. Differences in socioeconomic standing between the strata mirror these differences in husbands' occupations (47 percent of the rural, 74 percent of the urban Thai, and 95 percent of the Thai–Chinese women lived in households with five or more modern goods).

METHODS

This analysis focuses on the third-parity progression (i.e., the rate at which women with two children have a third child). In parity progression analysis, the subjects of interest are the rate at which a woman makes the transition from one birth to the next and differences (heterogeneity) in this rate between population groups. Furthermore, changes in this transition rate associated with the duration of the birth interval (nonstationarity) must be considered. The parameter that fulfills these criteria is the hazard rate.

The hazard rate describes the proportion of women who give birth during a specified time interval among all women who reach that interval without previously giving birth to a child of that order. The hazard rates for the third-parity progression (the rate at which two-parity women have a third birth) for rural and urban Thais and Thai–Chinese are displayed in Figure 1. (The AMS collected the event history data for annual rather than monthly units of time. Therefore, the hazard rates analyzed here refer

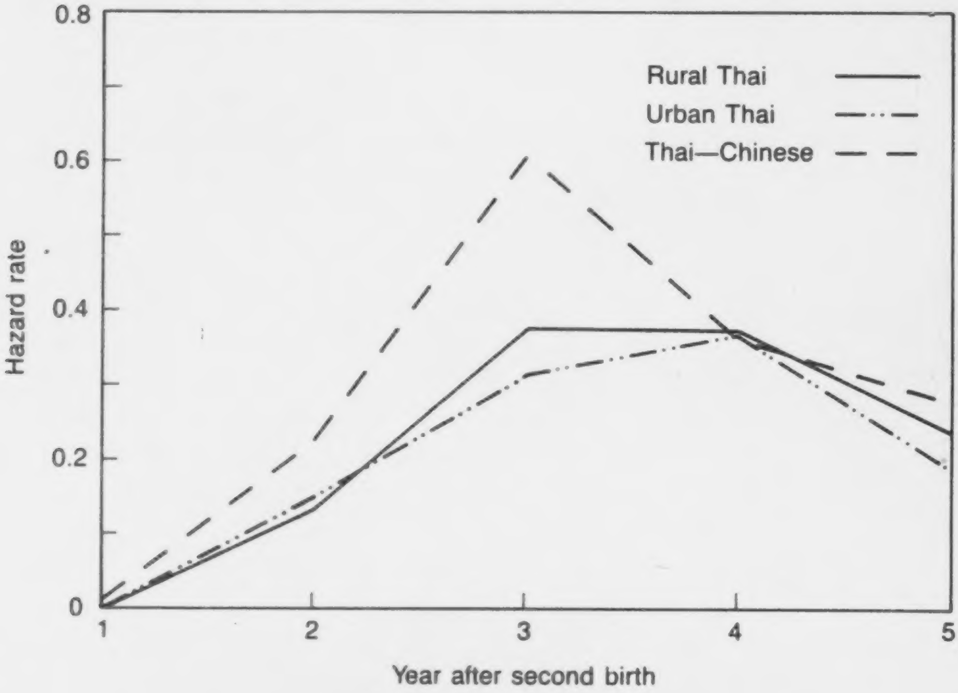

Figure 1. Hazard rate of third-parity progression among Thai women, by ethnicity and residence

to yearly intervals.) These rates indicate that Thai-Chinese have much higher rates of third births during the first three years after the birth of the second child. For example, 60 percent (0.605) of the Thai-Chinese women who did not have a third birth within twenty-four months of their second child's birth had their third child within the next twelve months, compared with 37 percent (0.373) of the rural women and 31 percent (0.312) of the urban Thais.

Hazard rates can be cumulated (using standard methods for demographic survival tables) to determine the percentage of the population experiencing the parity progression by each age. Figure 2 displays the cumulative parity progression rates for third births, based on the hazard rates of Figure 1. By the end of three years, 58 percent of the Thai-Chinese had given birth to their third child, compared with only 37 percent of the urban and 40 percent of the rural Thais. These differences eventually converge somewhat (perhaps as a result of unintended births); but even five years after the second birth differences remain, with 78 percent of the Thai-

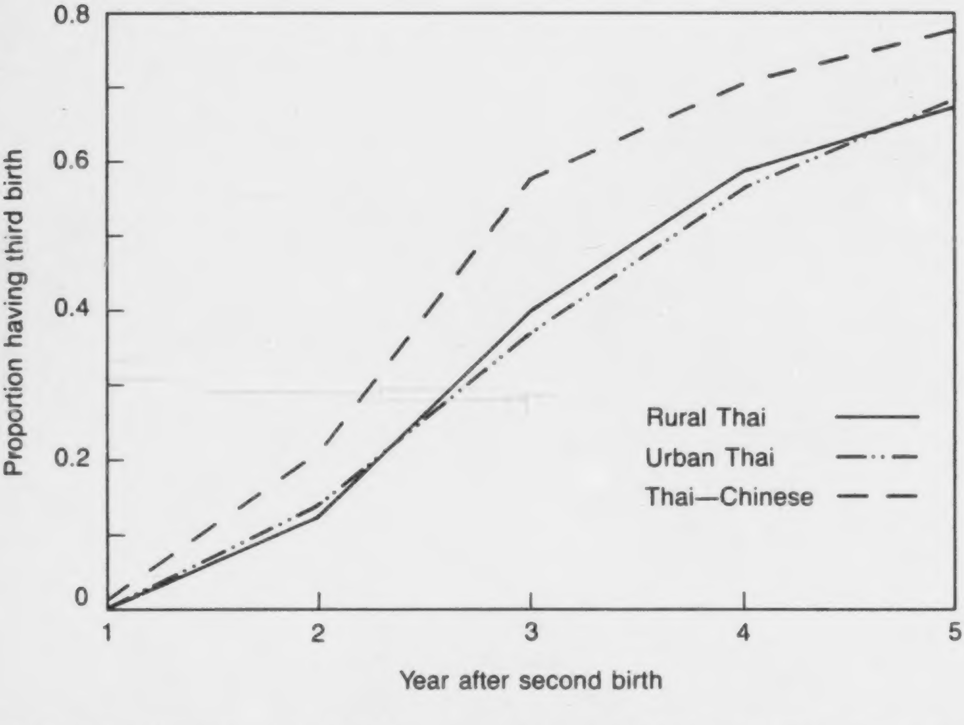

Figure 2. Proportion of Thai women having a third birth, by ethnicity and residence

Chinese, 68 percent of the rural Thais, and 64 percent of the urban Thais giving birth to a third child. In this analysis, we use the percentage of women closing the birth interval within three years (derived from the hazard rate) as a convenient summary measure of overall differences in the underlying rates of parity progression for women in each of the strata, classified according to their marriage arrangements, relative status, human capital skills and economic activities, and family socioeconomic status (Tables 1–4).

After discussing these initial results, we estimate multiple classification analysis (MCA) models of the number of births beyond the second in order to summarize overall differences in the subsequent fertility histories of these two-parity women. These models show the net effect of each of the women's status variables on the subsequent number of children born, controlling for number of years since the second birth and age at second birth. These models are used to test for interactions between the measures of female role equality and other women's status variables.

Statistical methods also are available for the estimation of the net effects of multiple variables on a hazard rate (Tuma and Hannan 1984). With parametric models the analyst specifies the form of the time dependence of the hazard rate. Nonparametric models leave unspecified the way in which the hazard rate depends on time, but they assume that it has a similar form for each group being compared. (See Tuma and Hannan 1984 for a formal exposition on these models. Useful didactic discussions of the methods are found in Sorensen 1980 and Teachman 1982. For applications of these methods to demographic transitions, see Hannan, Tuma, and Groeneveld 1977; Sandefur and Scott 1981; Menken et al. 1981; and Hogan and Kitagawa 1985.) These models are analogous to a multivariable survival table and thus take into account the full experiences observed for the population at risk of the event. But the technique does not require the large numbers of cases that are required for such survival tables, which is an important consideration in situations where surveys with moderate sample sizes are being analyzed.

All of these models begin with the assumption that the effects of population heterogeneity are proportional at all times. That is, if some variable increases the rate of parity progression by a certain percentage at one time, it produces a similar proportionate increase in the rate at other times, even though the base rate may differ from one time to another. Though this assumption of proportionality is rarely met exactly, the models are relatively robust in providing an unbiased estimate of the average effect of a variable on the hazard rate.

In this paper we use the partial likelihood estimation procedures proposed by Cox (1972, 1975) to obtain the proportional increase or decrease in the hazard rate of the third-parity progression associated with the independent variables. This model leaves unspecified the time dependent form of the hazard distribution associated with each parity interval. We also use these models for additional tests for interactions between gender equality in the family and other measures of women's status.

RESULTS

The third-parity progression

The effects of many aspects of marriage arrangements on the rate at which women with two children have a third birth can be seen in Table 1. The results are summarized using the percentage of women bearing a third child within three years of their second child's birth. Courtship before marriage and the bride's role in spouse selection were found not to be significantly related to parity progression. A later age at marriage was associated with a lower rate of third births, but only among urban Thais. Brideprice and parity progression rate were found to be significantly related only among rural women. Those women whose marriage required the payment of a brideprice tended to have fewer additional children beyond two. Marriage form was related significantly to fertility among Thai women in both rural and urban areas. Those whose marriages were traditional or formal tended to have a two-child family; those who just lived together as married couples or whose marriages were associated with elopement were more likely to have a third child. Among the Thai–Chinese this relationship was not found.

Among the urban Thai women, marriage between bride and groom of the same status decreased significantly the parity progression rate. Those couples in which the bride's status was different from the groom's, especially when the groom's was higher, tended to have higher fertility. Childbearing and family size may be one mechanism among the urban Thai married couples for equalizing their status, especially when the women's initial status at marriage is lower. Thai–Chinese couples in which the bride was of lower status also showed this relationship, though the result was not statistically significant.

Village endogamy (that is, marriage between spouses from the same village) was found to be significantly related to the parity progression rate among the Thai–Chinese and was characterized by higher fertility. About 90 percent of the women who married husbands from the same village had a third child within three years of their second, compared with 64 percent of those who did not marry endogamously.

In the rural areas, virilocal residence after marriage was related to a larger family size (73 percent of such couples had a third birth within three years), compared with 59 percent of those who lived with the bride's family. Couples who lived neolocally after marriage were least likely to have a third child (52 percent within three years).

The measures of women's status within the family were not consistently related to the rate at which couples with two children had a third (Table 2). The relative educational levels of husbands and wives had no statistically significant effect on the rate of parity progression. As hypothesized, greater sex-role equality among rural women was associated with a somewhat lower rate of third births, but the relationship was opposite the expected direction and not statistically significant from zero among the urban Thais and Thai–Chinese. The wife's involvement in family decisions did not significantly affect the Thai couples' decision about a third child. Among the Thai–Chinese there is a statistically significant association, but the direction of the effect is opposite that hypothesized, with 75 percent of those wives highly involved in family decisions having a third birth within three years of the second birth, compared with 65 percent of wives who were less involved.

The effect of education and labor force characteristics of women on the rate of parity progression is investigated in Table 3. We hypothesized that education at the start of the third birth interval would be negatively related to the rate of the third births, but this result held only among the Thai–Chinese. These differences were large (76 percent of those with four years of schooling or less and 30 percent of those with five or more years of schooling had a third birth within three years) and statistically significant, although very few Thai–Chinese women had more than four years of schooling.

The hypothesized negative effect of wage work before and after marriage also characterized the Thai–Chinese, with fewer of those who had wage work experience having a third birth (Table 3). Among the urban Thai women, wage work after marriage was associated with a significant decrease in the likelihood of having a third birth (64 versus 48 percent). The woman's opinion about work outside of the home after marriage had an inconsistent relationship with the birth of a third child. Women who worked at skilled or white-collar jobs after the birth of their second child were less likely to have a third birth among both rural and urban Thais. But this difference was not statistically significant.

The husband's occupation was not statistically related to the rate of third births among these women (Table 4). Among urban women of low socioeconomic status, the recorded rate of a third birth was somewhat higher, but this result was not statistically significant.

MCA models of fertility

We next estimated a number of exploratory multiple classification analysis models of the total number of additional children born to two-parity women, controlling for the age of the woman at the birth of her second child and the number of years of exposure since the second birth. This analysis permitted us to measure simultaneously the effects of several of these varia-

Table 4. Family economic status and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai–Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Occupation of husband						
Small trade or unskilled	12.4	64.7	19.4	54.2	4.1	100.0
Farm	34.2	56.9	0.0		0.0	
Skilled	35.6	56.6	46.8	52.5	27.0	66.7
White-collar	17.8	63.3	33.9	63.9	68.9	69.0
Ownership of modern goods						
Few	52.6	59.4	26.4	63.0	9.1	85.7
Many	47.4	58.3	73.6	54.4	90.6	67.9

Note: The significance test presented in this table reports the results of a Lee-Desu test for differences in the overall survival distributions.

bles on the total subsequent fertility behavior of these women. The MCA model facilitates the estimation of net effects and tests for interactions between the independent variables.

We began by combining the different variables indicating marriage arrangments into a single model to determine the net effect of each dimension of marriage and to test for interactions between the dimensions. We then estimated a second MCA model that focused on women's status within the home, a third for education and labor force experiences, and a fourth that considered husband's occupation and the measure of household socioeconomic level. From the results of these MCA analyses (not shown) and the parity progression survival analyses (Tables 1–4), we decided to focus on seven variables in the remainder of this analysis. These include marriage form, the payment of a brideprice, the equality of roles between husband and wife, the wife's involvement in family decisions, the wife's education and occupation at the beginning of the third-parity interval, and family socioeconomic status.

Taken in combination, these variables had statistically significant effects on the number of third and higher parity births of rural women and Thai-Chinese (Table 5). However, these effects were relatively modest among the rural women, accounting for only a 5 percent increase in explained variance. The effects of marriage form on fertility were not significant once other women's status variables were taken into account. The payment of a brideprice was associated with fewer additional children among rural

Table 5. Multiple classification analysis of the number of third and higher-order births among Thai women, by residence and ethnicity

Independent variables	Residence and ethnicity		
	Rural Thai	Urban Thai	Thai–Chinese
Marriage form			
Formal or traditional	1.43	1.38	1.67
Informal	1.37	0.95	1.10
Brideprice	*		**
Paid	1.22	1.07	1.98
Not paid	1.69	1.39	1.43
Equality of roles			
Low	1.42	1.37	1.70
High	1.40	1.13	1.54
Wife's involvement in decisions	*		
Low	1.53	1.33	1.70
High	1.24	1.13	1.56
Family's socioeconomic status		*	**
Low	1.50	1.60	0.83
High	1.31	1.13	1.72
Wife's education			**
0–4 years	1.41	1.30	1.76
5 or more years	1.40	1.05	0.77
Wife's occupation			*
Housework	1.37	1.34	1.40
Farm, unskilled, or trade	1.39	1.29	1.79
Skilled or white-collar	1.62	1.15	2.03
All variables	1.41	1.25	1.64
Increment to R^2 (% explained)	5.1	4.5	16.5
Significance of main effects	.010	.492	.024

Note: These MCA models include controls for the number of years between the second birth and the interview in 1979 and for the woman's age at second birth.

* $p < .15$.

** $p < .05$.

*** $p < .01$.

women but higher fertility among the Thai–Chinese. Greater sex-role equality did not affect the number of additional children, although rural wives who were more involved in family decisions had about 0.3 fewer children. Women from higher socioeconomic status families had significantly fewer children in the urban areas. Among the Thai–Chinese the few women with five or more years of schooling had substantially lower fertility (0.99 fewer children). The occupational activity of the wife after the birth of her second child did not affect the subsequent fertility of the rural women or the urban Thais. Among the Thai-Chinese the effects of occupational activity were marginally significant ($p < .15$) but opposite the expected direction.

We next tested for statistically significant interactions between female sex-role equality and the other measures of women's status (to test our fourth hypothesis). None of these were statistically significant at conventional levels ($p < .05$). Among rural women the only marginally significant interaction ($p < .08$) was that women with low sex-role equality who engaged in farm work had higher than expected fertility. It is probable that these women were engaged in farm work because of economic necessity. Among urban women the only marginally significant interaction ($p < .11$) involved the higher than expected fertility of women with low sex-role equality who married through elopement or cohabited without marriage. The effects of other measures of women's status variables on fertility did not vary significantly ($p < .15$) by the extent to which these women were involved in family decisions in either the urban or rural populations. We did not do MCA tests for interactions between these independent variables among the Thai-Chinese because of the small number of sample cases.

Proportional hazards models

To confirm that these results were not simply the result of small sample sizes or censoring biases in the multiple classification analysis models, we pooled the urban and rural samples and estimated a Cox proportional hazards model for the third-parity progression (tabulations not presented). When age at the beginning of the parity interval is controlled, women who were married in traditional or formal ceremonies had third births at a rate 22 percent lower than women who eloped or cohabitated without marriage ($p < .06$). The only other women's status variable that had even a marginal effect on the rate of third births was occupation at the beginning of the interval. Farm and unskilled laborers had an estimated third-birth rate 12 percent lower than that of housewives, and women in skilled and white-collar jobs had a rate 24 percent lower ($p < .16$). Further tests indicated no statistically significant interactions between the measures of sex-role equality and women's involvement in family decisions and the other independent variables.

As discussed in the first section of this paper, Knodel, Chamratrithirong, and Debavalya (1987) have highlighted four major factors in the Thai fertility decline. Two of these factors (social changes increasing the perceived cost of children and organized family planning programs) were largely absent in the early 1960s and emerged as factors of major importance only in the late 1960s and early 1970s. These changes in Thai society are believed to have created a social and environmental context in which the receptivity of Thais to fertility control became actualized. If this theory is correct, we should find increases in the effects of the women's status variables in more recent years.

To test this hypothesis we reestimated the proportional hazards models discussed in the previous section for the populations of women who began their third birth interval during 1960–69 and 1970–76 (Table 6). The only variable that affected the rate of third births among women who had their second child during 1960–69 was age of the mother at second birth (each additional year of age reducing the rate of a third birth by some 4 percent). None of the other variables affected the rate of third births. The rate of third births for women having their second child during 1970–76 was significantly affected by the mother's age at the start of the birth interval, the marriage form, and mother's occupational activity. Women who eloped or cohabitated without marriage had a third-birth rate 50 percent higher than that

Table 6. Proportional hazards model of the third-birth rate among ethnic Thai women, by period

	1960–69			1970–76		
Independent variables	Multiplier of rate	Chi-square	*P* value	Multiplier of rate	Chi-square	*P* value
Age at start of inverval	0.968	2.15	.143	0.955	4.27	.039
Marriage form		0.97	.326		3.60	.058
Formal or traditional				1.000		
Informal				1.498		
Brideprice		0.13	.718		0.36	.551
Sex-role equality		0.01	.905		0.25	.618
Wife's involvement in decisions		0.05	.824		0.02	.874
Wife's education		0.40	.527		0.01	.914
Wife's occupation		0.00	.949		3.05	.081
1 = Housework				1.000		
2 = Farm, unskilled, or trade				0.798		
3 = Skilled or white-collar				0.637		
Ownership of modern goods		0.03	.864		0.02	.885
Fit of model (degrees of freedom)		2.10 (1)	.147		12.64 (3)	.006

of women who married in a traditional ceremony. Women with farm, unskilled, and small trade jobs had a third-birth rate 20 percent below that of women who were not in the labor force; and women who worked in skilled and white-collar jobs had third-birth rates 36 percent lower. These findings support the hypothesis that the society-wide changes occurring in Thailand during the 1970s provided the social environment in which the low-fertility influence of the traditional Thai patterns of family formation and women's labor force involvement became actualized.

CONCLUSIONS

This analysis of individuals' behavior has yielded results supportive of the conclusions of Knodel, Chamratrithirong, and Debavalya (1987) about the Thai fertility decline. It appears that traditional Thai patterns of kinship and family, and of substantial female involvement in the labor force, provided a cultural base for family-size limitation once the net economic value of children declined and acceptable and effective contraceptive methods became available. We did not find that the magnitude of these effects was substantially larger in Bangkok, perhaps owing to the considerable economic and social development that has occurred in rural Thailand. It should be noted, however, that the particular rural community examined in this study is located near Bangkok and has probably developed more rapidly than more remote rural communities, especially those in other regions.

These traditional patterns of kinship and coresidence and the greater labor force involvement and economic independence of women are the basis for claims that Thai women have a high degree of sexual equality (Yap 1985). Knodel, Chamratrithirong, and Debavalya (1987) have demonstrated that Thai Moslems (who lack such cultural traditions) persist in having larger numbers of children. Similarly, our analysis has shown that the Thai-Chinese also persist in having higher fertility than the Thais despite their higher socioeconomic standing and urban residence.

Taken in combination, these findings suggest to us that the Thai kinship system, organized on principles of bilateral kinship and inheritance, personal choice of mate selection, and uxorilocal or neolocal postnuptial residence, provided the critical cultural basis for Thailand's remarkably rapid decline in fertility. The social and economic arrangements found in patrilineal kinship systems appear to limit substantially the status of women and provide cultural props for high fertility not only in Thai Moslem and Thai-Chinese populations, but also in other nations (Cain 1984). In such societies, rapid fertility declines may require substantially higher levels of economic development. That is, the net value of children may have to become significantly negative before couples abandon high fertility traditions in favor of birth limitation.

Cultural arrangements determining the status of women appear to have pervasive effects on the fertility of all members of the population. We found no evidence that direct measures of women's status (sex-role equality or involvement in family decision making) affect the fertility of women within a particular cultural setting. This research suggests that studies that focus on the kinship and economic arrangments that determine the status of women across cultural settings may be a more productive path of inquiry than studies that focus on the status of individual women within societies. Additional research is needed that focuses on the effects of women's status on fertility within and between societies to test this claim.

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Family Planning Accessibility and Adoption: The Korean Population Policy and Program Evaluation Study

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CONTENTS

PREFACE *xi*

ABSTRACT *1*

BACKGROUND AND SUMMARY *1*

THE KOREAN NATIONAL FAMILY PLANNING PROGRAM *3*

THE KOREAN POPULATION POLICY AND PROGRAM EVALUATION STUDY *4*

- Pretest *4*
- Field Operations in Cheju *5*
- Project Costs *18*
- Fertility Changes *21*
- Changes in Contraceptive Use *23*
- Summary of KPPPES's Accomplishments *33*

THE 1975 BASELINE SURVEY *34*

- Cheju in 1975 *34*
- Plausible Explanations for Low Contraceptive Use in Cheju *39*
- Baseline Survey Results in Hapchun *41*
- Private-sector Contraception *43*

THE 1980 INTENSIVE SURVEY *44*

- The Questionnaire *44*
- Field Work, Coding and Editing, and Data Quality *45*
- Effect Measures *46*
- Changes in Fertility Control Measured by the Survey *46*

CONCLUSION *56*

APPENDIX: ACCESSIBILITY MEASURES HAVING SIGNIFICANT CORRELATIONS WITH AFTER MEASURES *59*

REFERENCES *121*

FIGURES AND TABLES

FIGURES

Map. Location of study sites 7
1. Average number of monthly acceptors: pills, 1976-81 25
2. Average number of monthly acceptors: condoms, 1976-81 26
3. Number of acceptors: tubal ligations, 1976-81 27
4. Number of acceptors: IUDs, 1976-81 28
5. Number of acceptors: vasectomies, 1976-81 29

TABLES

1. Program costs by area: 1976-79 (in US dollars) 20
2. Couple-years of protection (CYP), acceptors, and population, by area: 1976-79 22
3. Own-children estimates of the total fertility rate (ages 15-44), by area: 1972-75 and 1977-80 23
4. Percentage change in age-specific fertility rates from 1972-75 to 1977-80, by area 24
5. Percentage of married women 15-49 years of age currently using contraceptives, by age and area: 1975 and 1980 30
6. Percentage of married women 15-49 years of age currently using contraceptives, by method and area: 1975 and 1980 32
7. Mean number of children ever born to all women and to ever-married women, by women's current age: Korea and Cheju Province, 1975 35
8. Mean number of children ever born to currently married women, by women's current age and area of residence: Korea and Cheju Province, 1975 36
9. Percentage of currently married couples sterilized (husband or wife) or who had ever used contraception, by women's current age and area of residence: Korea and Cheju Province, 1975 37
10. Percentage of currently married women who had ever used induced abortion, by women's current age and area of residence: Korea and Cheju Province, 1975 37
11. Percentage distribution of contraceptive methods currently used by married women 15-49 years of age, by area: Korea and Cheju Province, 1975 38

12. Percentage of currently married women who had received a home visit from a family planning worker, by women's current age and area of residence: Korea and Cheju Province, 1975 *39*
13. Percentage of currently married women who wanted no more children, by women's current age and area of residence: Korea and Cheju Province, 1975 *40*
14. Mean number of living children among currently married women, by women's current age and area of residence: Korea and Cheju Province, 1975 *41*
15. Selected fertility and family planning indicators for currently married women, by women's current age and area of residence: Rural Cheju and Hapchun County, 1975 *42*
16. Selected indicators of family planning accessibility: Korea and Cheju Province, 1975 *43*
17. Measures of contraceptive use among ever-married women 15–49 years of age: Cheju and Hapchun, September 1976 to November 1980 *47*
18. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER A as the dependent variable: Cheju and Hapchun 1980 intensive survey *49*
19. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER B as the dependent variable: Cheju and Hapchun 1980 intensive survey *50*
20. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER C as the dependent variable: Cheju and Hapchun 1980 intensive survey *51*
21. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER D as the dependent variable: Cheju and Hapchun 1980 intensive survey *52*
22. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER E as the dependent variable: Cheju and Hapchun 1980 intensive survey *53*
23. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER F as the dependent variable: Cheju and Hapchun 1980 intensive survey *54*
24. Percentage of married women 15–49 years of age, by age of woman, who stated they had been contacted by a canvasser, family planning worker, or other health center personnel about family planning: Cheju and Hapchun, 1975 and 1980 *55*

1A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER A) *60*

1B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER B) *62*

1C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER C) *64*

1D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER D) *66*

1E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of affective accessibility: Cheju and Hapchun (AFTER E) *68*

1F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of affective accessibility: Cheju and Hapchun (AFTER F) *70*

2A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER A) *72*

2B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER B) *74*

2C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER C) *76*

2D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER D) *78*

2E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER E) *80*

2F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER F) *82*

3A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER A) *84*

3B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER B) *85*

3C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER C) *86*

3D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER D) *87*

3E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER E) *88*

3F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER F) *89*

4A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER A) *90*

4B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER B) *92*

4C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER C) *94*

4D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER D) *95*

4E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER E) *98*

4F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived geographic accessibility: Cheju and Hapchun (AFTER F) *100*

5A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER A) *102*

5B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER B) *104*

5C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER C) *106*

5D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER D) *108*

5E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of program quality: Cheju and Hapchun (AFTER E) *110*

5F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them or had stopped using them before September 1976, by selected measures of program quality: Cheju and Hapchun (AFTER F) *112*

6A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER A) *114*

6B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER B) *115*

6C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER C) *116*

6D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER D) *117*

6E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected socioeconomic measures: Cheju and Hapchun (AFTER E) *118*

6F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected socioeconomic measures: Cheju and Hapchun (AFTER F) *119*

PREFACE

The Republic of Korea is widely believed to have one of the most successful government-sponsored family planning programs in the world. Marital fertility has declined significantly over the past two decades because of increases in contraceptive use, and the government has been the primary provider of contraceptive services until recently. One reason for the success of Korea's program has been the government's willingness to try new ideas in its effort to improve family planning services to the Korean population. The Korean Population Policy and Program Evaluation Study (KPPPES), reported here, is one example of the government effort. Throughout the study, we were impressed by how rapidly the government implemented the lessons it was learning from the study—sometimes so rapidly that differences between the experimental area and nonexperimental areas were blurred.

There have been many previous reports on the KPPPES, both in the Korean language and in English (e.g., Chai Bin Park; Cho, and Palmore 1976, 1977, and 1980; Chai Bin Park et al. 1982; Moon Sik Hong, Choi, and Oh 1978; Sawon Hong 1976, 1979; Chen and Worth 1982); but some of them were conference presentations and others were published in sources not widely available. This report is the first that tries to draw together all of the major lessons learned from the study. Although the main results have been known for several years, we believe it is nevertheless worthwhile to have a summary of the whole project because what was learned in the KPPPES may be useful in other family planning programs.

Contraceptive prevalence in Korea today is very high. By 1985, 70 percent of married Korean women were using contraception (Palmore and Bulatao 1988), whereas only 19 percent of married women between ages 15 and 49 were using contraception in Cheju at the beginning of the study. Thus the relevance of the KPPPES will be greatest to other countries where contraceptive prevalence is still low.

Research on this project was funded under a contract with the United States Agency for International Development. The research involved the cooperation of the East-West Population Institute with numerous Korean agencies. The Bureau of Statistics (Economic Planning Board), the Korean Institute for Family Planning (now the Korean Institute for Population and Health), the Population Research Center of Dong-A University, and the Cheju Development Institute were the primary institutions involved in the research, while the Ministry of Health and Social Affairs and the provincial governments of Cheju Province and Kyeongsangnam Province were the agencies responsible for delivering family planning services.

We wish to express our thanks to many persons at those and other institutions. In particular we wish to acknowledge our indebtedness to Jae

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ABSTRACT This paper describes an experiment with a community-based contraceptive distribution system in Cheju, an island province of the Republic of Korea. The use of village-level canvassers to encourage couples to accept contraception was the principal innovation. This paper summarizes the study design, field operations, cost effectiveness, and findings on changes in contraceptive prevalence and fertility levels in the experimental area. The role of accessibility to birth control methods in these changes is also assessed. The new delivery system increased contraceptive use dramatically and lowered fertility considerably, particularly in the rural areas of the island. The cost per acceptor and per couple-years of protection in the experimental area was competitive with that of the national program.

When the project began in 1975, Cheju had the highest fertility and the lowest family planning performance in Korea. By the end of the project in 1980, Cheju ranked highest on several performance indicators and rural Cheju had lower fertility than the rest of rural Korea. The program was particularly successful in the rural areas. In the urban areas, because the program was less well implemented there, the results were somewhat less successful.

BACKGROUND AND SUMMARY

Starting about 1960, the Republic of Korea began a remarkable fertility transition that within twenty years reduced the crude birth rate by nearly half. During the same period, the total fertility rate declined from more than six to less than three children per woman. The National Family Planning Program, begun in 1962, was undoubtedly responsible for part of this impressive decline, although rising age at marriage also contributed to it (Khoo and Park 1978; Kong, Park, and Kwon 1981). Moreover, the government program undoubtedly helped legitimize contraceptive use through the private sector. By 1982 nearly 60 percent of all eligible couples were using contraceptive methods (Moon, Hahm, and Shin 1982), and by 1985 this figure had reached 70 percent (Palmore and Bulatao 1988). In 1975, however, differences in practice levels among various socioeconomic groups and regions were still considerable. Westoff asserted as late as 1978 that there should be concern over the unmet need for contraception (Westoff 1978).

Throughout the 1970s, the question of how to satisfy the unmet need was debated in Korea as it was in most developing countries with family planning programs. ("Unmet need" is a term that includes both felt and unfelt need.) On one hand, efforts could be directed at enhancing the demand for services by mounting persuasive information, education, and communication campaigns, augmented (where possible) with generous incentives for acceptors. On the other, efforts could be made to increase the availability of fertility regulation methods by improving the supply and delivery of services. Ravenholt and Chao (1974), for example, argued that increasing the availability of services was the best solution (see also Brackett 1981). Freedman and Berelson (1976) suggested that that solution should at least be tried. Community-based distribution of nonclinical contraceptives is one method to increase availability. The suggestion that the method might work was later (after this study was completed) given some credibility by multivariate analyses of World Fertility Survey data indicating that the level of contraceptive availability in communities directly influenced the likelihood of current use (Tsui et al. 1981a, 1981b; Pebley and Brackett 1982).

The Korean experiment on the effect of the availability of contraceptives began in 1975. Entitled the Korean Population Policy and Program Evaluation Study (KPPPES), the experiment was initiated by the East-West Population Institute (EWPI) with the collaboration of the Korean government and several Korean research institutions. The study had two distinct phases. First, a brief feasibility study was conducted that used three innovative delivery systems (Chai Bin Park, Cho, and Palmore 1977). Then a larger study, based on the results, was carried out in Cheju Province, with Hapchun County in Kyeongsangnam Province serving as a comparison area. Baseline and posttreatment surveys were conducted in both locations.

The next section of this report describes the Korean National Family Planning Program as it was in the mid 1970s and when the KPPPES began. With the adoption of a primary health care approach and other changes, the rural health care system has expanded greatly since then. The third section describes the KPPPES design and field operations, and summarizes the overall results of the study: its effect on fertility, costs incurred, and changes in contraceptive use. The findings based on an intensive survey designed to assess the effects of accessibility are presented in the final section.

Over the five-year study period, fertility in Cheju declined rapidly (by 30 percent), the costs of the program were reasonable, and family planning use increased dramatically, current use among eligible couples increasing from 19 percent to 40 percent. The project was, in fact, remarkably successful. At the start of the KPPPES, Cheju had the poorest family planning performance of any province. Before the KPPPES ended, Cheju had one of the highest acceptance rates (Nam Hoon Cho 1987). For example, in 1978 toward the end of the project, Cheju had the second highest rate of acceptors among married fecundable women (that is, women at risk of pregnancy), the third highest number of couple-years of protection per married fecundable woman, and the largest number of family planning acceptors per governmental family planning worker (Nam Hoon Cho et al. 1979). The major question this report addresses is whether or not accessibility to family planning services was the main cause of these changes.

THE KOREAN NATIONAL FAMILY PLANNING PROGRAM

In the mid 1970s the Korean National Family Planning Program operated within the administrative structure of the Ministry of Health and Social Affairs. The program was implemented through a network of nearly 200 city and county health centers, with some 3,000 family planning field workers attached to the centers. The principal responsibility of the field workers was the recruitment of acceptors who then obtained oral contraceptives (pills) or condoms from the field workers and other services at the health centers. In addition, approximately 1,500 private physicians were under contract to the government to provide clinical services (mainly insertions of intrauterine devices, or IUDs) to clients referred to them by the field workers. The program was supported primarily by appropriations from the general budget of the Korean government, although foreign donors provided assistance in materials, training, public information, and evaluation. (See Taek Il Kim, Ross, and Worth 1972 for a review of the program's early years.)

Family planning workers were stationed throughout the country. The program had two levels of administration in urban areas and three levels in rural areas. At the provincial level, several family planning supervisors assisted the provincial health officer and supervised health center staff. The number of supervisors and field workers in the county and city health centers varied, depending mainly on the number of clients they were supposed to serve.

In cities, the supervisors and workers were responsible to the director of each health center for the operation of the program—including direct home visits, registration of clients, the distribution of contraceptives, and client referrals to clinics for services. In county health centers, there was another layer of family planning workers stationed in towns (*eup*) and townships (*myun*), the next lower government administrative layer. As a rule, each town or township had one family planning field worker with the qualifications of a health aide who contacted potential clients and did administrative work. This worker reported to the administrative head of the town or township rather than to the health center director. Supervisors at the health centers were related to the whole county-wide program through the town and township workers, and they assisted the health center director in the administration of the county-wide effort.

The government program provided four contraceptive methods: the IUD, pill, condom, and sterilization. Early in the program, emphasis was placed on the IUD. Pills were introduced in the late 1960s. Around 1977, however, emphasis shifted to sterilization, particularly female sterilization. Except for token fees collected for pills and condoms, all services were provided free of charge, with the government absorbing the costs. In addition, menstrual regulation was provided on request, some of the procedures being used in effect for induced abortion. (For a full review of contraceptive method choices in Korea, see Choe and Park 1987.)

The Korean program is generally acknowledged to be one of the best in the developing world. Nevertheless, it has had some problems. Several of them, relating to the availability of contraceptives, are discussed at length in Chai Bin Park, Cho, and Palmore (1977). Those authors report that a field worker served an average of more than 10,000 persons living in many villages separated by rivers, mountains, and fields. Depending on the contraceptive method offered, acceptance caused greater or lesser financial burdens for the acceptors, although this problem is less common at present. A rigid target system, prescribing a target for each contraceptive method, was also problematic because it may have discouraged clients from accepting the method they preferred and encouraged them instead to accept a method for which the target had not yet been achieved. Additional difficulties stemmed from a maze of formalities that impeded access to supplies. Distances between users and service points were also at issue. In fact, problems associated with the program appeared to involve all five major components of accessibility: economic, administrative, geographic, cognitive (knowledge), and affective (motivational).

THE KOREAN POPULATION POLICY AND PROGRAM EVALUATION STUDY

The KPPPES was an experiment designed to minimize many of the problems associated with the National Family Planning Program in 1975 and to maximize the availability of contraceptives to couples needing them. It combined a new family planning delivery system with efforts to evaluate the system by measuring changes in contraceptive use and fertility among the people served, and by determining the cost-effectiveness of the system relative to that of the national program.

Pretest

A pretest of three delivery systems was carried out in Euiryong County in Kyeongsangnam Province, a typical rural area, prior to the major project activity in Cheju Province. The objective was to test the feasibility, acceptability, and cost-effectiveness of the three delivery systems so that a good design could be developed for the larger project in Cheju.

The pretest field work occurred between May and September 1975 (see Chai Bin Park, Cho, and Palmore 1977 for details). Three townships within Euiryong County, roughly matched in their socioeconomic and demographic characteristics, were selected for study. The county health center maintained a small supervisory staff and one field worker in each township. As in all other rural areas of Korea, clinical methods were handled by four county physicians who were under contract with the health center for their services. The existing structure was augmented by village canvassers recruited from among women in the villages to call upon their neighbors. After making an initial visit, these canvassers maintained a liaison function between the village women and township family planning workers and provided resupplies of pills and condoms.

An effort, called the "100 percent method," to contact 100 percent of eligible women was tried in one township. A canvasser visited each household in her village to register all couples at risk of pregnancy. The couples were offered the alternative of a free three-month supply of pills or condoms or a referral to the local physician for a free IUD insertion or vasectomy.

A "group method" was tried in the second township. All women at risk of pregnancy were invited to a village meeting with the canvasser, and there the women were informed of the family planning program and given the same choice of services and supplies as those in the other townships. Women who did not attend the meeting were given a follow-up call by the canvasser. This delivery system proved inefficient because the canvasser had to visit all of the women before the meeting to extend an invitation and explain the purpose of the meeting, whereas she could have offered contraceptives during the initial contact without holding the later group meeting.

In the third township, a "ten percent method" was tried. The government family planning worker selected one woman from every tenth house in the village. This woman was offered a small stipend to be a distributor and contact person for those in the other nine houses who wanted contraceptives. This system worked well from the standpoint of having neighbors of the target population make the initial contact, but some of the women selected to be distributors were very casual about their responsibilities and required reminding and prodding by the family planning workers.

The 100 percent method was selected for the Cheju Province program after the Euiryong County pretest was evaluated. An encouraging result in Euiryong was that the acceptance of contraceptives increased in all three townships. Furthermore, all three canvassing systems appeared to be cost-effective.

Field Operations in Cheju

Located 85 kilometers off the southwest coast of the Korean mainland, Cheju Island is the smallest province in Korea. Its geography is dominated by an extinct volcano, Mt. Halla, which rises 1,950 meters above the sea. The climate is mild and temperatures along the 250-kilometer coast seldom drop to freezing.

Owing to the climate, the southern shore of Cheju is the only citrus fruit-growing area in all of Korea. The mountain slopes are used for cattle pastures and the lower levels near the ocean are sown with rice, barley, and vegetables. About one-fifth of the households engage in fishing, the men with nets and lines for regular fishing and the women as divers for shell fish and seaweed. Compared with other rural areas of Korea, the women in Cheju are unusually active economically.

This island province has one small city, Cheju City, and two rural counties, North County and South County. North County is divided in half by Cheju City in its center, and has six townships, one of them situated on a smaller island located between Cheju and the mainland (see map). Because of its inaccessibility, the island township in North County was excluded from the study. South County consists of seven towns and townships covering the whole of the southern coast. The provincial government is headquartered in Cheju City.

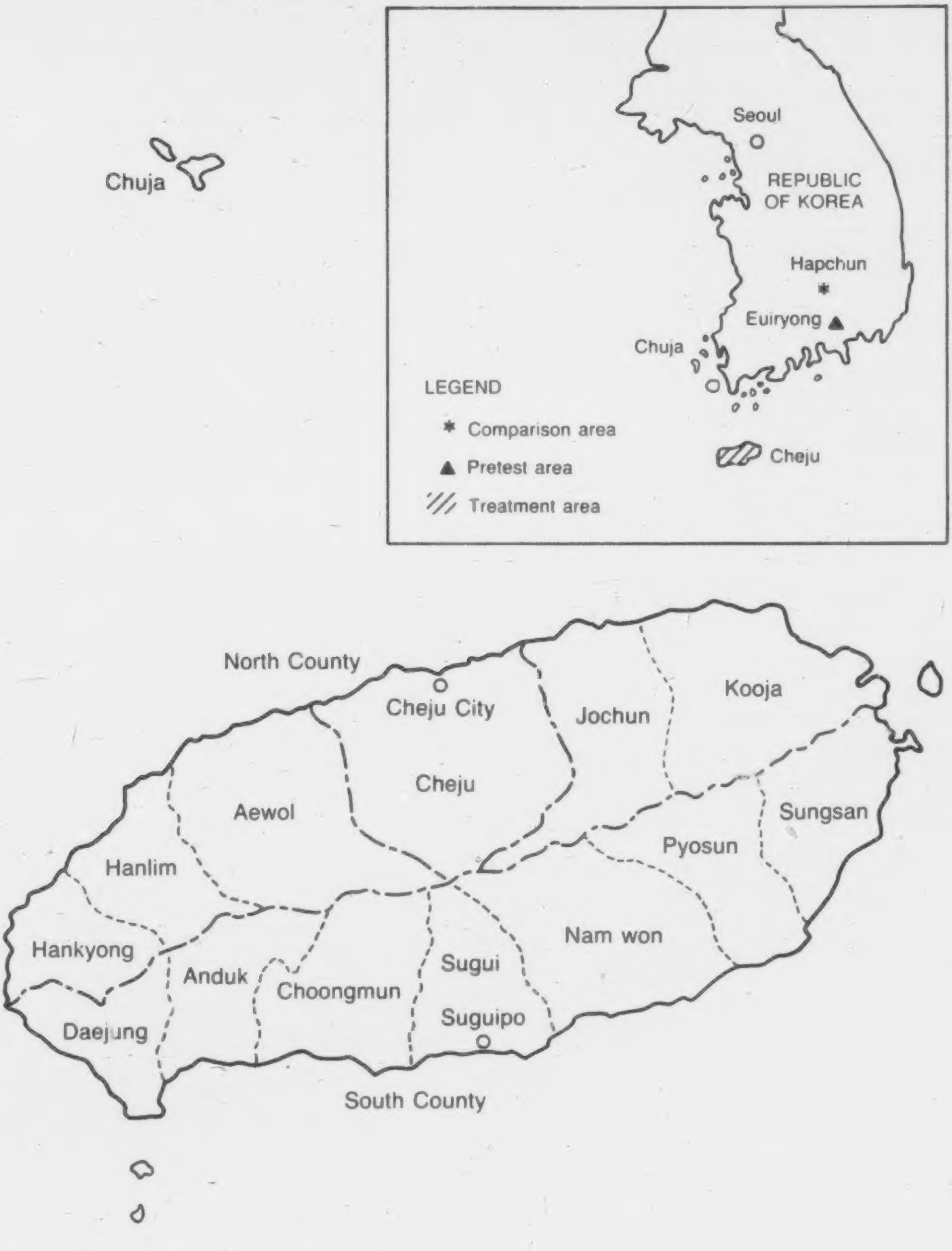
Cheju's population, consisting of some 420,000 persons at that time, was divided among the three administrative units so that some 30 percent lived in the city, 30 percent in North County, and the rest in South County. Migration patterns have influenced this population, with groups going to and from the mainland as well as an unknown, but small, number traveling back and forth between Cheju and Japan.

When the KPPPES field operations began in 1976, Cheju had participated less in the fertility transition than other areas of Korea: the 1970 total fertility rate for Korea was about four children per woman, whereas that for Cheju was above five. In the regular ratings of provincial efforts in family planning, Cheju consistently ranked lowest in achievement among all the provinces (Nam Hoon Cho 1987).

Design of the program

The design for the KPPPES called for only modest modifications within the existing framework of the National Family Planning Program. This was to make it easy for the Korean government to adopt the same design in other areas if the KPPPES proved successful.

The main feature of the new delivery method in the experimental area was the addition of a new layer of 365 canvassers to the existing national delivery system, following the pattern found effective and efficient in the pretest. The canvassers were in charge of contraceptive distribution in their own villages and villages nearby, and they worked under the supervision of township-level family planning field workers. Whereas family planning field workers had previously been expected to make direct contact with 900


Seoul
REPUBLIC OF KOREA
Hapchun
Euiryong
Chuja
Cheju
LEGEND
* Comparison area
▲ Pretest area
/// Treatment area
Chuja
North County
Cheju City
Cheju
Jochun
Kooja
Sungsan
Pyosun
Aewol
Hanlim
Hankyong
Anduk
Choongmun
Sugui
Suguipo
Nam won
Daejung
South County

Map. Location of study sites

to 1,300 households, these canvassers were to be responsible for contacting only from 200 to 300 households. The canvassers would handle registration and provide most of the direct services, under the supervision of the field workers. They were to register all at-risk women and keep the registration lists up to date.

In September 1976 the canvassers began making home visits to explain the contraceptive services available and to offer a three-month supply of pills or condoms. If a couple was interested in having an IUD insertion or sterilization, the wife or husband had to go to one of the physicians under contract with the government. With the endorsement of the field worker, the canvasser would issue the client a coupon entitling the bearer to free services when presented to a physician, who was then reimbursed for the services by the government.

After making initial contact, the canvasser operated a contraceptive supply depot out of her home, maintaining sufficient quantities of pills and condoms for immediate resupply to any in need in the village. The house was marked by a small signboard designating it as an agency of the family planning program. In addition to her resupply work, the canvasser was to continue to provide information about the program to couples, to register those who were entering the at-risk group, and to offer coupons for clinical services, making arrangements for transportation to the health center when several persons wished to go there together. (Often neighbors would accompany their friends on these trips in the health center vehicle.) The township field worker visited each canvasser at least once a month to check her records and supplies, and to discuss questions and problems beyond the scope of the canvasser's brief training.

The canvassers were paid the equivalent of about US $20 a month during the initial house-to-house visiting period of three months. When their activities switched to the depot system, they received a smaller retainer fee of US $6 per month. In addition, they were reimbursed for transportation and paid a per diem to attend monthly meetings. The one exception to this remuneration method was in Sugwi Town, where the canvasser's compensation was initially based partly on performance.

Physicians performing IUD insertions for the program were located throughout the island, nine out of fifteen of them practicing outside the city of Cheju. All three of the clinics offering vasectomies, however, were in Cheju City, as were four of the five physicians performing tubal ligation. Only one city clinic used laparascopic techniques during most of the study period, although one in South County eventually started providing this type of operation. Since public transportation is well organized in the province and was supplemented by health center vehicles (and by Planned Parenthood of Korea vehicles for vasectomies), the absence of clinical services at a particular locale did not seem to be an important barrier to availability. Eight physicians on short-term contracts supplemented the regular clinical services. The project did not include experimental efforts to improve services through the clinical network, except during the last four months of 1976, when it supplemented the physicians' contract fees for tubal ligation.

Ordinarily, reporting in the National Family Planning Program is done through monthly activity summaries submitted by the field workers to the health centers. These reports are then summarized and sent to the provincial headquarters, which in turn reports to the Ministry of Health and Social Affairs. During the KPPPES copies of the coupons issued for clinical and nonclinical services were also collected and sent along with summary service statistics to the Korean Institute for Family Planning (reorganized and renamed the Korea Institute for Population and Health in 1981) for analyzing and reporting the activities of the national program. Over the life of the project the number and types of reports increased. A new coupon was developed that included a client number for the computerization of service statistics. Each canvasser was also assigned a number so that performance in various villages could be followed.

The Ministry of Health and Social Affairs provided contraceptive supplies from the national program to the health centers. At the city health centers, the family planning workers drew upon the supplies for nonclinical methods. The IUDs and inserters were sent from the health centers to physicans upon request. At rural health centers, the supplies were taken by the township field workers and stored in warehouses at the township offices. No changes in these procedures were made for the KPPPES.

Funds for the National Family Planning Program came from the national budget and were sent to the provincial governments, where items were added and sent on to the city and county units. Administrative wings of the health centers handled disbursement of funds from the various accounts. During the KPPPES the government continued to support the regular Cheju Family Planning Program, with one very important modification: the Ministry of Health and Social Affairs suspended the target system, its basic recruitment and supervision system, in the project area. Under the national program, money for clinical services was allocated according to estimated targets for IUD insertions and sterilizations, and this, in effect, put a ceiling on the number of procedures that could be performed under any health center's jurisdiction since doctors could not be paid for more than the annually appropriated number of procedures. The national government increased its budget so that Cheju Province never had a shortage of funds for clinical services during any year of the KPPPES. This increased funding freed workers from having to advocate particular methods to achieve their acceptance goals for a given year. As a result, contraceptive method choice was determined by acceptor preferences. As Peter Donaldson has pointed out (personal communication, 1987), without the KPPPES the government's target system established both a ceiling and a floor for acceptances. What the KPPPES did was to remove both ceiling and floor and replace them with a different criterion for success—contact with all at-risk couples.

In the comparison area, Hapchun County, the organization of the National Family Planning Program was identical to that of other government projects throughout the nation, described in the previous section of this report. The county health center was the administrative unit responsible for the project. A field worker was assigned to each of the eight townships and worked under the supervision of the family planning and administrative staff of the health center. The field workers distributed condoms and pills directly to those requesting them. Clinical method acceptors were referred to physicians—four specializing in IUD insertions and two providing vasectomies—and the distance between clients' homes and the clinics did not seem to be a problem. The situation was problematic for tubal ligations, however, as there were no physicians in the county qualified to perform the procedure until 1978, and bus rides of sixty or eighty miles to city hospitals were necessary. When a physician qualified in this technique moved into the county in 1978, the number of women receiving tubal ligations more than tripled. A smaller, but still large, group received tubal ligations in 1979.

Removal of barriers

The main purpose of the KPPPES was to remove barriers to contraceptive accessibility. An economic barrier, for example, may be present because of a charge for the service or travel and other incidental costs. By bringing the supplies of condoms and pills to the village, the program removed the need for acceptors to travel to the town office or health center. For clinical services, however, travel was still necessary. Ways were explored to reimburse clients for bus fares, but officials of the bus companies refused to honor free passes or a coupon system as payment because they believed it would be administratively difficult and subject to cheating. This idea brought negative reactions from local government administrators as well and was therefore abandoned. Instead, the KPPPES provided health center vehicles when several persons wished to travel to the clinic at the same time.

The national program provided all clinical methods except for tubal ligation without charge. For tubal ligations the government payed about US $10 of the clinics' fee, and the client was required to pay an additional US $20. For the KPPPES, the clinics agreed not to charge clients for tubal ligations on the condition that the project paid US $20 per client and provided each physician with another laparascope set to speed up the provision of services. This arrangement was in effect from September through December 1976. In 1977 the government increased its reimbursement for this operation to US $30 throughout Korea so that the service became free to all patients and at no cost to the project.

During the KPPPES a fee of US 10 cents was charged for a month's supply of pills, and national government officials were considering a small charge for condoms. The plan was to experiment with these fees by giving away the initial three-month supply of pills and condoms in all except one township, Sungsan, where the fees would be charged. For resupplies and later acceptors of both condoms and oral pills, the fees would be charged—again with the exception of Sungsan, where the pills and condoms would be given free for the rest of the project period. Differences in contraceptive acceptance rates would then indicate the effect of the fees as a barrier to acceptance.

An administrative barrier to contraceptive acceptance can be produced by excessive or complicated paperwork, having to wait for services, or a supply system that seems formidable to the client. In the national program, the field workers were usually to be found in an administrative building where all of the clerks, mostly male, sat in a large open room and did business publicly with the citizens who came in. Many women who came to the township office for family planning services were embarrassed to be seen by all of those men and by the lack of privacy during their consultation.

The KPPPES removed this administrative barrier by shifting the contact point for most services from the township office to the canvasser's home in the village. Moreover, when a field worker came to the village, clients could arrange for consultation in the privacy of their own homes. Other administrative barriers of the government program, such as the requirement that clients put their personal chop (stamp) on documents and show their civil identification number, were also eliminated. Nevertheless, the project complicated the regular paperwork of the government program and necessitated additional entries on the forms.

To remove a geographic barrier to acceptance, the KPPPES moved the contact point for family planning services from the township office into the village. As villagers previously had had to walk for two or more hours to reach the township office, this change made the program much more accessible to the average person. Nonclinical services were provided in the village itself. The clinical service network was not changed to improve geographic accessibility, except in South County, which received a laparascope late in the project period. Then women were able to obtain tubal ligations without having to go all the way to Cheju City.

Lack of information about available services is a cognitive barrier to acceptance. The KPPPES's main contribution to removing this barrier was increasing the number of personnel in the field from thirty to 365. The new canvassers were given enough training initially to answer simple questions and provide basic information. Over time the regular field workers taught them more and helped with consultations during their own monthly visits. The field workers and health center supervisors also had monthly meetings with the canvassers to continue their training and answer questions. All this meant that there was much more information about contraceptive services available in the villages than previously.

An affective, or motivational, barrier to acceptance may have also been reduced by the greater possibility of personal and private contact between family planning personnel and their prospective clients.

Baseline and postproject surveys

A baseline survey was taken of a 25 percent probability sample of married women 15–49 years of age in both the experimental and comparison areas in conjunction with the 1975 Korean census, held in October. This survey serves as a reference point because it was conducted eleven months before the new delivery system began in September 1976. (Details of the questionnaire, sample design, and field work can be found in Palmore, Park, and Cho 1985.) A similar survey of a 20 percent sample was taken in conjunction with the 1980 census, nearly one year after the conclusion of the KPPES field operations. Response rates for both surveys exceeded 95 percent.

The two surveys provide the principal data for evaluation. Thirty-four questions were asked in the baseline survey and 41 in the postproject survey, in addition to the census questions. Information collected included the number of children ever born; number of miscarriages, stillbirths, and abortions; marriage history; family planning knowledge, attitudes, and practice; and whether the respondent had had contact with family planning workers.

The postproject survey also involved a ninety-minute, in-depth interview conducted with a probability sample of approximately 1,000 respondents in Cheju and 1,000 respondents in Hapchun. The interviews yielded detailed information on family planning accessibility and the five types of barriers to it.

Administrative preparation

There were 55,377 married women between ages 15 and 49 in Cheju Province in 1975. It was decided that one canvasser should cover about 300 households in urban areas and 200 households in rural areas. This ratio of workers to respondents was radically different from that in the national program, where the typical number of households served by a worker was about 1,300 in urban areas and about 900 in rural areas. Overall, there was roughly one canvasser for every 150 married women of ages 15–49 in Cheju during the KPPES.

Census enumeration districts were chosen as the basis for delineating canvasser areas. As the average enumeration district contained only eighty households, various enumeration districts were joined to form 365 canvasser areas.

A map of each canvasser area was made for the use of the canvasser, showing the location of individual households and identifying them by name and number as established from the census records. Also shown on the map were roads, streams, bridges, buildings, and other landmarks to help the canvasser find houses.

A form was created for recording basic information about each woman at risk, which the canvassers completed during household visits. The canvassers also prepared daily activity sheets and weekly summaries, and they were provided with new coupons for clinical services that contained more information on the clients than did the coupons used in the national program.

Recruitment and training of canvassers

In July 1976 each village chief was asked to nominate potential canvassers who were living in the same canvasser area in which they would serve, married, relatively well educated, preferably 30 to 50 years old, respected and trusted by their neighbors, and experienced in family planning activities (for example, active in the village Mother's Club). The family planning field workers forwarded these nominations to the health center, where they were screened. The director of the health center then requested the county chief or the mayor of Cheju City to give the nominees official appointments as canvassers.

All of the 365 persons appointed lived within their canvasser areas, and most met most of the other criteria for selection. Thirty-eight percent were below age 30 and another 12 percent were age 40 or older. About 30 percent had only an elementary school education—which may have been why problems developed with record keeping.

In August 1976 staff members of the Korean Institute for Family Planning (KIFP) conducted training activities for the canvassers. The trainees used a 175-page training text, prepared for the program, that covered such topics as population, the family planning program, contraceptive methods, the delivery system, and family planning education; and they were given a manual of procedures to use in performing the various routines. These materials were distributed to all related government workers as well.

Experienced KIFP instructors led the training sessions. They were joined by several government supervisors in Cheju. Before any training sessions were held for the canvassers, all of the government workers—including administrators, supervisors, and field workers—were given a one-day orientation to the project by means of the text and a manual. The canvassers were divided into nine groups for the three-day training course. Materials in the text and field manual were explained to them in detail during this time.

When the field operations began in September 1976, the canvassers reported that they were still confused about the various forms and how to fill them out. A team therefore traveled around the province for a week to give them practice in these routines and to answer their questions.

Refresher training was held in July 1977 for supervisors, field workers, and canvassers. This time was also used to review changes in the program that had come from one year's experience.

Progress and modifications in field operations

The canvassers started to make their home visits in early September 1976, equipped with lists prepared from census reports and forms to complete for the registration of women who were at risk of pregnancy. These were defined as women not pregnant or breastfeeding who had not been sterilized or reached menopause, were not using an IUD, and were living with their husbands.

The canvassers were prepared to give at-risk women, without charge (except in Sungsan), a three-month supply of either pills or condoms. They also had coupons for free clinical services for IUD insertion or sterilization.

Because the canvassers were paid a higher rate for the first three months and put on a retainer fee subsequently, the project administrators wanted the canvassers to visit all of the eligible couples during this initial period. In the rural areas this period coincided with the tangerine harvest, and therefore prospective clients were very busy and difficult to locate. It took an average of two trips to a household to make contact with the woman to be registered. To further complicate the situation, the harvest also brought migrants into the area. Nevertheless, the canvassers enrolled 82 percent of the targeted number (42,000 women) within the first three months of the field operations. Continuing visits brought enrollment over the top in about five months.

In the urban areas the canvassers had difficulty getting people to open their doors to them. Some urban women who were canvassed were already well informed about family planning methods, and many of them were using commercial sources. At the end of three months, canvassing in fifty-nine of the ninety-eight canvassing areas in the downtown area of Cheju City remained to be completed. In Sugwi Town, thirty-four out of thirty-nine canvassing areas were incompletely canvassed. Consequently, a special group of home visitors was hired in May to complete the canvassing.

Altogether 56,250 women were ultimately enrolled, among whom 43,079 were considered to be at risk. Of these, 14,233 accepted contraception at the time of the home visit—11,018 accepting either condoms or pills delivered by the canvassers.

The shift to the depot system occurred in December 1976, although the initial canvassing was still under way. There were no major problems in the rural areas, but the complexity of the report forms, registration numbers, and the like, was not well received by either the canvassers or the clients. The project administrators therefore decided to simplify the forms and discontinue the effort to match every acceptor with the baseline survey data. Identification numbers were eliminated, as many coupons that arrived at KIFP were missing either the number or the acceptor's name, both of which were required for matching.

In the urban areas, women did not know the canvassers, and in some cases the canvassers did not want their homes identified with a sign. Hence, most resupply was done through the health center or occasional visits by field workers. As a result, sixty-nine canvassers in areas adjacent to the three health centers were dropped from the project. To assist the field workers in Cheju City, nine of the best canvassers were retained to do home visiting in a wider area. Those women were paid about $30 a month and expected to work approximately ten days a month.

Beginning in August 1977, thirteen additional canvassing areas were created in the rural areas, and areas included in some other canvassing areas were modified. This step was taken because some of the canvassing areas were found to have ignored natural village lines. The purpose was to improve the relationship between the canvassers and those contacting them about family planning.

To alleviate problems caused by the complexity of the forms, in 1977 the project adopted simpler forms and issued a new manual explaining how the new forms should be completed. A training session was held to introduce these changes.

To improve morale and communication, township and county officials were encouraged to hold monthly meetings with the canvassers. The opportunity to share their successes and problems at these meetings encouraged the canvassers to participate actively in the project. Some of them organized savings clubs, using the proceeds for trips, parties, or presents. The mass media were also used to encourage and give recognition to the canvassers. Some canvassers appeared on television or were the topic of stories in the local newspapers. The KIFP newsletter started a special column on events in Cheju.

To estimate the effect of private-sector contraception on program acceptance, project staff checked drug stores in March 1977 for the volume of over-the-counter contraceptive sales (Palmore et al. 1977a). Of the 128 stores registered with the health center for the sale of drugs, eighty-three had licensed pharmacists and were doing most of the business. The volume of commercial contraceptive sales was three times larger than the project's distribution of condoms and twice as large as the project's pill distribution at that stage of the project.

The number of clinical procedures performed in the private sector was thought to be very small in Cheju Province. The government's IUD program had been so large over the years that commercial distribution of these devices was almost unheard of outside of Seoul. Sterilization was heavily subsidized and done at government expense by the most competent physicians in Cheju, so that any privately performed procedure would probably require a trip to a clinic in Seoul, thus making the number of such procedures small.

Transfer to the provincial government

The KPPPES ended on 31 December 1979, at which time the provincial government began maintaining its own family planning program in Cheju Province. All financial assistance for canvassers and other administrative arrangements also ended then, but the provincial government decided to retain the canvassers on a voluntary basis for certain functions as part of the nationwide New Village Movement.

The New Village Movement was organized to improve rural life in Korea and was accorded considerable prestige, publicity, and funds to carry out its purposes. In 1977 all government-recognized women's clubs in the villages were combined into one New Village Movement Women's Club. Among the clubs that were thus absorbed were the Mothers' Clubs that had been related to the National Family Planning Program and the Planned Parenthood Federation of Korea. To continue volunteer family planning activities in support of the government program, each village appointed a Family Planning Committee chairperson within the New Village Movement Women's Club. The provincial government decided to transfer canvasser functions to this Family Planning Committee chairperson.

In late 1979, when the KPPPES project administrators examined the social roles of canvassers, they discovered that more than half of the canvassers were officers in the New Village Movement Women's Club. Accordingly, the provincial government sent instructions to villages where this was not the case to appoint the canvasser as an officer of the Family Planning Committee, and in large villages where there were two canvassers, to make them cochairpersons. In this way, the relationships developed between the canvassers and the villagers over the past four years could be continued. The functions of the canvassers that were assigned to the Family Planning Committee chairperson were to keep the villagers informed about family planning and encourage them to use available methods, to maintain the record book for all those women at risk of pregnancy in the village who were registered for family planning, and to distribute pills and condoms to those in the village who needed them.

The township family planning field worker was to continue her monthly visits to the villages to check with each chairperson on her activities, record keeping, and supplies. She was also to meet with anyone who needed special advice beyond the abilities of the chairperson and to make arrangements for those who wanted to go to a clinic for sterizilation or an IUD insertion.

In all other respects, the family planning program in Cheju Province then became the same as those in other provinces. Elsewhere in Korea, villages had volunteer Family Planning Committee chairpersons, but the chairpersons did not officially participate in the family planning program except to call occasional meetings of interested village women. In a few health centers and in certain townships, the chairpersons distributed pills and condoms informally under the supervision of the family planning worker.

It was unknown whether the canvassers who worked well when receiving a small monthly stipend would participate actively when there was only peer support and prestige to reward them for their work. Many of the canvassers indicated that they were happy to be of service to their neighbors, and this feeling about their work may have continued in the new setting.

The intention, hence, was to integrate the best features of the KPPPES system into the program that would continue in Cheju after 1979. These efforts did not last very long, however. As in the rest of Korea, political difficulties that began shortly after the KPPPES study was completed affected many aspects of life. Later, the entire health system was altered and strengthened, making many aspects of the KPPPES system obsolete.

Canvassers

The canvassers were the vital element in the delivery system. By making direct contact with all the eligible women in their areas, they were to be the supply and service points of family planning at the grass-roots level. Their attitudes regarding reproduction and contraception and their own reproductive behavior were thus of interest. In June 1978, KIFP conducted a survey of canvassers attending their usual monthly meetings (see S. Y. Hong, M. S. Hong, and Park 1978 for details). Response rates were rather poor, about 80 percent in the rural areas and 66 percent in the urban areas. The potential biases resulting from the urban nonresponse rates were particularly serious. Nevertheless, the results were instructive.

A great majority of canvasses stated that their family size ideal was three or fewer children; 60 percent preferred three children and 32 percent two children. Their contraceptive use rate was quite high; 73 percent were current users as compared with fewer than 25 percent of the population at risk in Cheju Province when the 1975 baseline survey was taken. Of those contracepting, more than one-third had had a tubal ligation.

In general, the canvassers did not consider the distance to service points to be a major problem. Only 23 percent thought that clients would be more likely to accept contraception if the service points were nearer.

Although 39 percent of the canvassers stated that their work was going better than they had expected, 30 percent were disappointed. In the urban areas, only 10 percent of the canvassers were satisfied that their work had met their expectations. As for their working conditions, 59 percent thought their pay was too little and 38 percent thought their pay adequate. Forty-six percent thought their workload was too heavy. Nearly all (93 percent) viewed the monthly meetings as helpful. Although 81 percent of the canvassers thought that they and government family planning workers should work together at family planning activities, 47 percent thought that they themselves were the ones actually doing the work. Sixty-four percent of the canvassers had clients come to their homes for resupply, whereas the others delivered supplies to their clients' homes.

These results indicate morale problems among the canvassers. It is not surprising, therefore, that the turnover among canvassers and supervisors was a problem throughout the project period. Continuing efforts to solve this problem involved training and field visits by supervisors. Fortunately, it was always possible to recruit new canvassers from within the villages. Not counting the heavy cutback of the canvassers in the city and near the health centers, there were 95 changes made among 318 rural positions during the course of the project.

The system of remuneration based on performance, tried in only one town, did not work well. The Sugwi canvassers, included in this experiment to see if incentives would increase the distribution of contraceptives, could not understand why they were being discriminated against in compensation. Their performance was about the same as the other canvassers' in distribution (46 percent compared with 43 percent) but below the average in home visits (48 and 60 percent, respectively); hence the effort was abandoned after three months. Calculating payments to canvassers for the incentive scheme meant a great deal more paperwork by all concerned.

Project Costs

A cost analysis was conducted for the experimental, comparison, and pretest areas,[1] although data for an all-Korea calculation unfortunately were not available for the same time period. Only direct costs were considered. Excluded from analysis were indirect costs such as administrative costs at the national and provincial levels; information, education, and communications costs; and research costs. Fees collected from clients for condoms and pills were treated as an income item for the government and subtracted from the total costs.

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[1] This section relies heavily on the analysis and compilations of S. Y. Hong and M. S. Hong of KIFP under the guidance of George C. Worth, EWPI consultant on KPPPES. Additional information on the delivery system is available in Worth (1980).

Direct (program) costs included the following items:

- Salaries and wages: all expenses paid directly to the government family planning workers at all levels by the government (i.e., monthly salaries, allowances, travel costs, and bonuses).
- Medical service costs: fees, incentives, and aftercare service costs involving IUD insertions and sterilizations. Costs related to menstrual regulation were not included, since this method was not performed for contraceptive reasons in the strictest sense, even though menstrual regulation is a part of the government fertility regulation program.
- Costs borne by health centers: administrative costs for family planning and costs of vehicle operation. These costs were not absorbed by the national government.
- Supplies: costs of condoms and IUDs procured by the government and the costs of the pills donated by the U.S. Agency for International Development (17 cents per cycle).
- Project add-on costs: allowances paid to the canvassers, their training costs, expenditures for monthly meetings, and medical service fees incurred for female sterilizations in 1976.

A total of $600,833 was spent during the preparation period and the forty months of the KPPPES field work. Twenty-five percent of this ($148,995) was provided by the KPPPES budget through KIFP, and the balance was drawn from national and local government budgets.

The total program costs by area and year are shown in column 1 of Table 1. We related three denominators to these costs: couple-years of protection, number of acceptors, and total population size. To compute the couple-years of protection, we assigned weights to acceptors by method, following the procedure used by KIFP at that time:

Method	Weight
IUD	2
Vasectomy	7
Tubectomy	7
Condoms	1 (per 100 condoms)
Pills	1 (per 13 cycles)

Table 1. Program costs by area: 1976–79 (in US dollars)

Area	Program cost	Cost per CYP[a]	Cost per acceptor	Cost per capita[b]
Cheju City				
1976[c]	$ 20,986	$ 9.82	$ 6.47	$0.43
1977	44,181	5.57	15.44	0.30
1978	46,333	6.47	16.36	0.32
1979	44,475	5.46	16.29	0.31
All years	155,975	6.14	13.37	0.32
North County				
1976[c]	25,478	15.46	12.18	0.64
1977	57,070	9.35	26.48	0.48
1978	56,447	10.44	27.67	0.47
1979	59,716	12.82	28.95	0.50
All years	198,710	11.12	23.80	0.50
South County				
1976[c]	35,072	9.00	10.04	0.63
1977	70,233	7.21	20.49	0.42
1978	71,003	7.71	18.58	0.43
1979	69,838	10.17	23.07	0.42
All years	246,147	8.28	17.88	0.45
Cheju Province				
1976[c]	81,537	10.62	9.24	0.57
1977	171,485	7.20	20.31	0.40
1978	173,782	7.98	19.99	0.40
1979	174,029	8.85	22.25	0.40
All years	600,833	8.24	17.79	0.42
Rural Cheju (North and South Counties)				
1976[c]	60,550	10.92	10.85	0.63
1977	127,303	8.01	22.80	0.45
1978	127,450	8.72	21.75	0.45
1979	129,554	11.25	25.45	0.45
All years	444,857	9.35	20.11	0.47
Euiryong County				
1976[c]	8,968	13.95	7.71	0.35
1977	38,821	10.99	21.53	0.50
1978	44,391	10.58	25.87	0.57
1979	43,450	11.40	32.38	0.56
All years	135,630	11.13	25.51	0.53

Table 1. *(continued)*

Area	Program cost	Cost per CYP[a]	Cost per acceptor	Cost per capita[b]
Hapchun County				
1976[c]	11,461	8.95	4.93	0.24
1977	53,386	8.72	18.20	0.37
1978	93,283	6.97	24.36	0.64
1979	78,833	9.37	30.89	0.54
All years	236,963	8.11	20.36	0.50

a. CYP—couple-year of protection.

b. Adjusted to represent annual cost.

c. Figures for 1976 pertain to the period September-December only.

The annual acceptor figures include the total numbers accepting clinical methods for the year and an average of those accepting condoms and pills monthly. The total population was based on the 1975 census. The numbers used as denominators are shown in Table 2.

Despite the additional start-up costs (for training, added fees for tubal ligations, and the like), the costs per couple-year of protection and per acceptor were in line with or even lower than in the comparison areas. As seen in Table 1, the initial costs in 1976 were much higher in the experimental areas than in Hapchun County. This is due partly to training and partly to the extra costs for female sterilization borne by the project in 1976. Starting in 1977, the expense of female sterilization was subsidized nationally by the government.

In summary, the cost analysis suggests that efficiency improved more in KPPPES than in the national program. The cost per effectiveness ratio was favorable. Nevertheless, as John Ross has noted (personal communication, 1987), the project increased both the numerators and the denominators. The new system spent more per eligible woman and per capita than the government program. A question for national programs elsewhere is whether they can afford so large and intensive an investment to achieve favorable cost-effectiveness ratios.

Fertility Changes

The project was successful in lowering fertility, particularly in the rural areas of Cheju (Table 3). Own-children estimates of the total fertility rates for the period 1972–75 and 1977–80, based on a 20 percent sample of the 1980 census, show fertility for Cheju Province to have fallen slightly more than for Korea as a whole (–30 percent versus –28 percent). For Cheju City, however,

Table 2. Couple-years of protection (CYP), acceptors, and population, by area: 1976–79

Area	CYP	Acceptors	1975 Population
Cheju City			145,451
1976 (4 mos.)	2,136	3,242	
1977	7,926	2,862	
1978	7,165	2,832	
1979	8,142	2,730	
North County			119,769
1976 (4 mos.)	1,648	2,091	
1977	6,167	2,155	
1978	5,405	2,040	
1979	4,657	2,063	
South County			166,677
1976 (4 mos.)	3,896	3,492	
1977	9,735	3,428	
1978	9,211	3,821	
1979	6,870	3,027	
Cheju Province			431,897
1976 (4 mos.)	7,680	8,825	
1977	23,823	8,445	
1978	21,781	8,693	
1979	19,669	7,820	
Rural Cheju			286,446
1976 (4 mos.)	5,544	5,583	
1977	15,892	5,583	
1978	14,616	5,861	
1979	11,517	5,090	
Hapchun County			144,674
1976	1,280	2,323	
1977	6,120	2,933	
1978	13,393	3,830	
1979	8,414	2,552	
Euiryong County			77,895
1976	643	1,163	
1977	3,533	1,803	
1978	4,197	1,716	
1979	3,812	1,342	

Table 3. Own-children estimates of the total fertility rate (ages 15–44), by area: 1972–75 and 1977–80

Area	Total fertility rate		
	1972–75	1977–80	% decline
Cheju Province	4,565	3,203	-30
All Korea	3,869	2,803	-28
Cheju City	3,993	3,226	-19
Urban Korea (excluding metro)	3,549	2,735	-23
South County	4,763	3,219	-32
North County	5,172	3,097	-40
Rural Korea	4,682	3,337	-29

Note: Estimates are based on a 20 percent sample of the 1980 census.

the fall in fertility was less than for the rest of urban Korea (–19 percent versus –23 percent). Both North and South Counties had greater fertility declines than did rural Korea as a whole, with the reduction in North County (–40 percent) being particularly marked. In fact, whereas both counties had fertility levels higher than the rest of rural Korea in 1972–75, their total fertility rates were lower than those of the rest of rural Korea by 1977–80.[2]

Age-specific fertility rates fell in every five-year age group for women over age 24. For North County the decline in age-specific rates exceeded the decline for all rural Korea in every age group, while for South County the declines exceeded those for all rural Korea at ages 20–24, 25–29, and 30–34 but fell short in the remaining age groups. Cheju City's declines were less than those for urban Korea in all age groups except ages 40–44 (Table 4). In summary, the fertility decline in the two rural counties of Cheju was substantial, exceeding even the rapid decline for the rest of rural Korea. In Cheju City, however, the fertility decline was less than the national average.

Changes in Contraceptive Use

The most direct goal of the KPPPES was to increase contraceptive use. How well that goal was accomplished can be assessed with service statistics and the survey data.

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[2] We did not compare own-children estimates for Hapchun and Euiryong Counties to those for Cheju because small sample sizes led to unstable estimates for those areas. For a description of the own-children method, see Lee-Jay Cho, Retherford, and Choe (1986).

Table 4. Percentage change in age-specific fertility rates from 1972–75 to 1977–80, by area

	Percentage change, by age group					
Area	15–19	20–24	25–29	30–34	35–39	40–44
Cheju Province	–11	–10	–19	–44	–51	–72
All Korea	–30	–15	–16	–40	–59	–70
Cheju City	+67	+5	–9	–33	–44	–82
Urban Korea (excluding metro)	–22	–7	–14	–38	–56	–71
South County	–23	–16	–27	–48	–37	–56
North County	–50	–27	–20	–50	–66	–81
Rural Korea	–30	–16	–16	–39	–58	–69

Note: Figures are based on own-children estimates obtained from a 20 percent sample of the 1980 census.

Service statistics

For the forty-month field work period, the total project-related services were as follows:

Method	Number
Condom packets (six pieces per packet)	64,593
Pill cycles	92,842
Tubal ligations	6,421
Vasectomies	1,042
IUD insertions	8,084

As a rule, government-compiled statistics slightly exceeded the corresponding KPPPES figures. For instance, in 1978 the government source showed 2,682 IUD insertions, 400 vasectomies, and 1,843 tubal ligations, whereas the project record showed 2,635 IUD insertions and 387 male and 1,817 female sterilizations, respectively. For supplies, the counting unit was different for the two sources: the government counted the average number of users whereas the project counted the supplies distributed. For 1978 the government source indicated an average of 1,833 condom users and 2,135 pill users. These numbers would correspond to 21,996 condom packets (if six condoms are used per month) and 27,755 cycles of pills (assuming that thirteen cycles are required per person per year). Project records, however, showed 21,632 condom packets and 24,618 cycles of pills dispensed that year. Some of the difference in service statistics may have been due to a jurisdictional difference since the government included the entire province of Cheju while the project excluded the off-island township of Chuja, with a population of 6,600. The differences in the two sets of statistics are small in any case.

To observe acceptance status for Cheju and the rest of Korea before, during, and after the field operation, we plotted government quarterly statistics on contraceptive acceptance (Figures 1–5). A major change in acceptance levels took place at the initiation of the program for each contraceptive method, although the changes may have been reversed at the close of the program.

During the initial canvassing, when couples were personally visited and offered free supplies, over 7,000 women accepted the pill (Figure 1). Although the number soon fell, a level of over 2,000 acceptors (which is about 20 to 30 percent higher than the preprogram level) was maintained through 1978. There was a downward trend beginning in 1979 and a big dip at the beginning of 1980, possibly due to the political situation at that

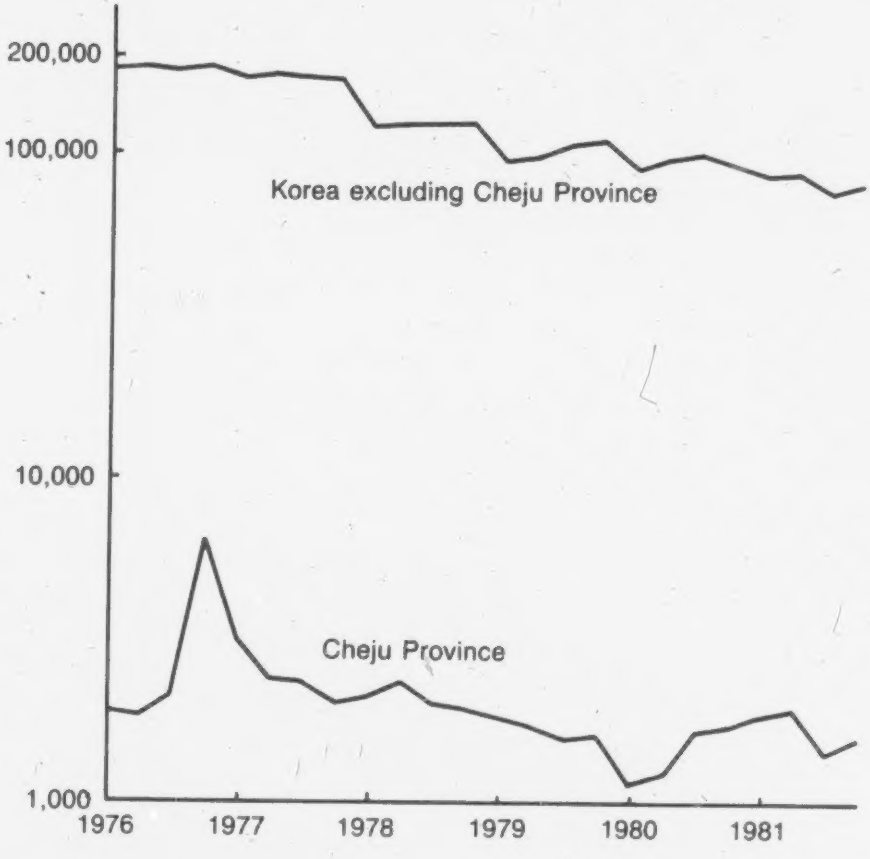

Figure 1. Average number of monthly acceptors: pills, 1976–81

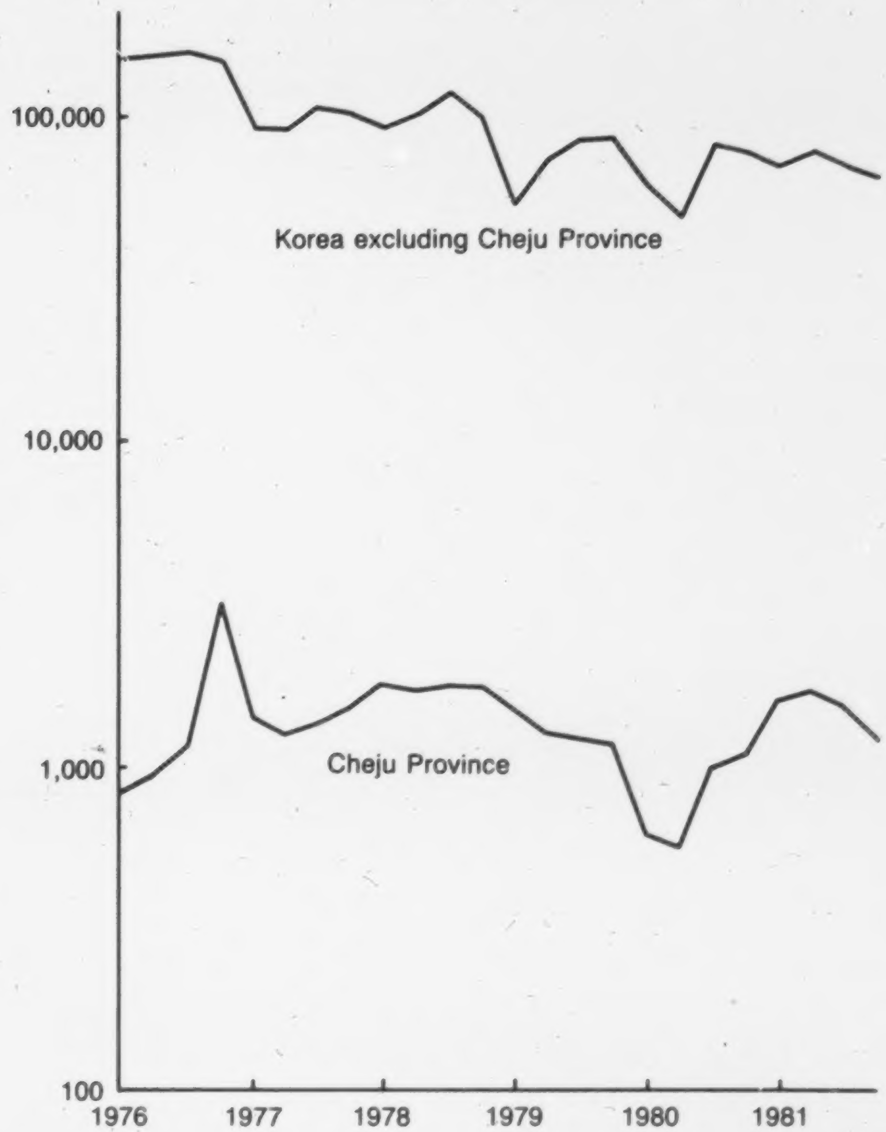

Figure 2. Average number of monthly acceptors: condoms, 1976–81

time; but in the latter half of 1980, acceptance reverted to the preprogram level. A marked decline occurred in Cheju City, but in rural areas the decline was minor, suggesting that more couples were using commercial supplies in the city. In comparison with Cheju, pill acceptance in the rest of the nation was on a steady downward trend over the five-year period, declining by about 50 percent.

Similar trends were observed for the acceptance of condoms. An abrupt gain coinciding with the initial canvassing in Cheju was followed by a sharp

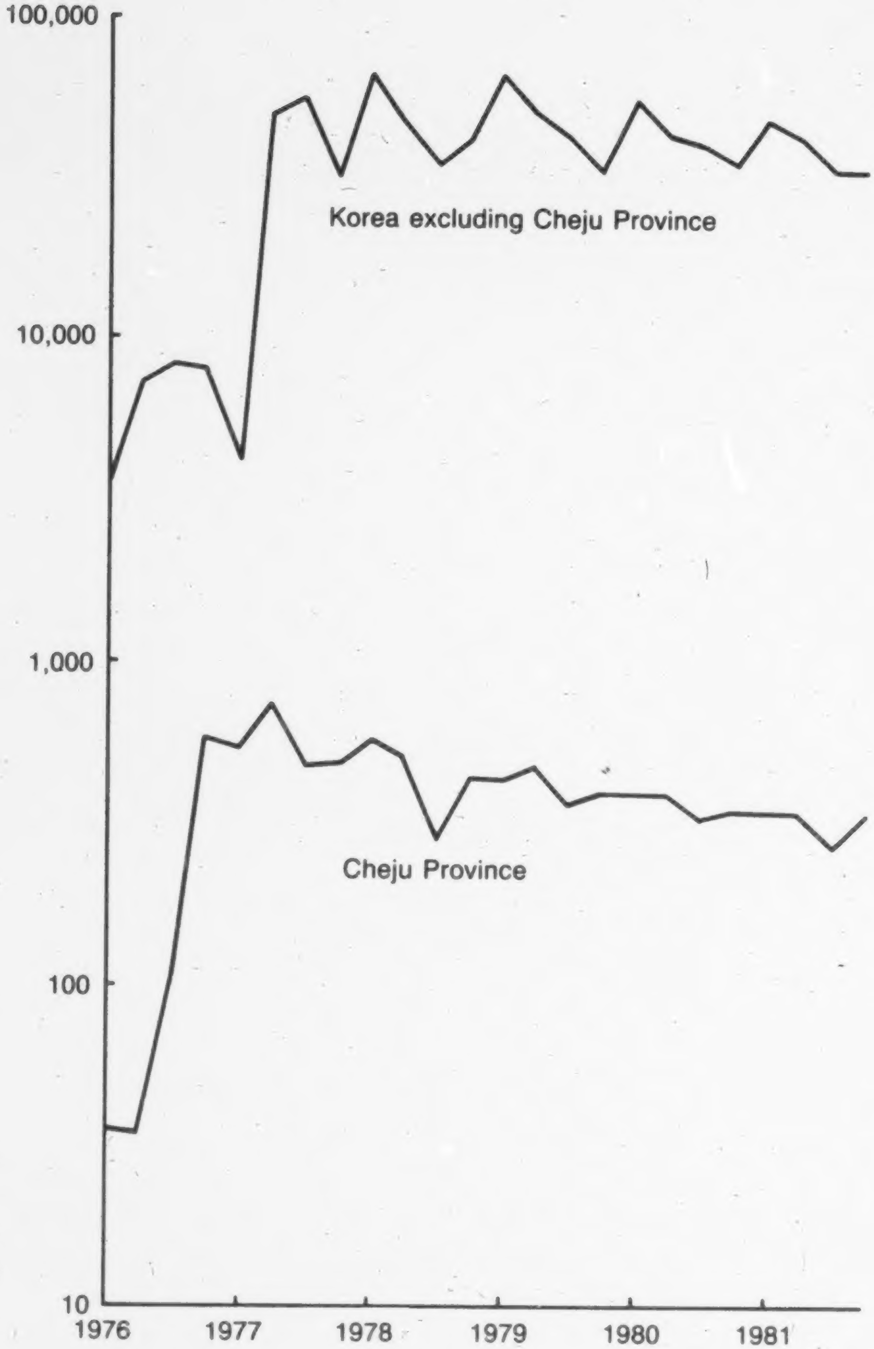

Figure 3. Number of acceptors: tubal ligations, 1976–81

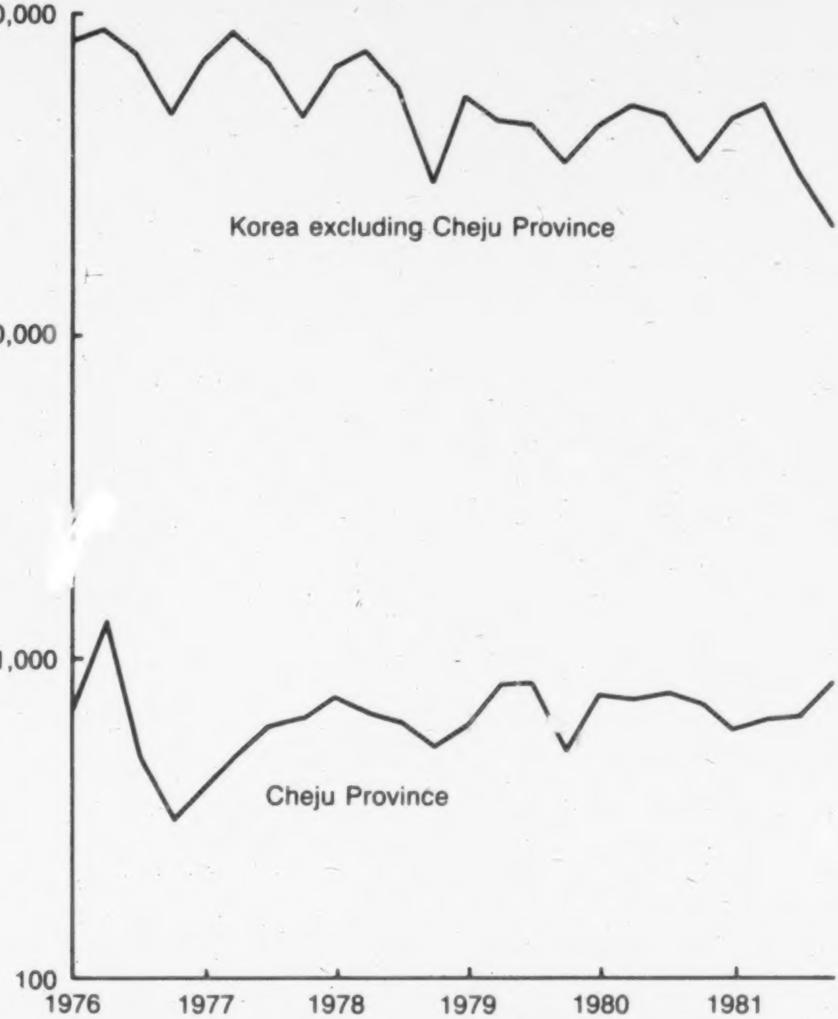

Figure 4. Number of acceptors: IUDs, 1976–81

drop soon thereafter, although the level of 1,500 acceptors per month was considerably higher than the preprogram level. As with the pill, acceptance dipped in early 1980. The national trend for condom acceptance was downward, from a level of 150,000 monthly acceptances in 1976 to 80,000–70,000 in 1981.

The initial effect of project activity on acceptances of sterilizations, pills, and condoms was a drop in monthly IUD insertions on Cheju Island from about 300 to about 100. This number later rose to about the preprogram level and appeared to be more or less stable. Nationally, IUD acceptance (which has been an important component of the national program since

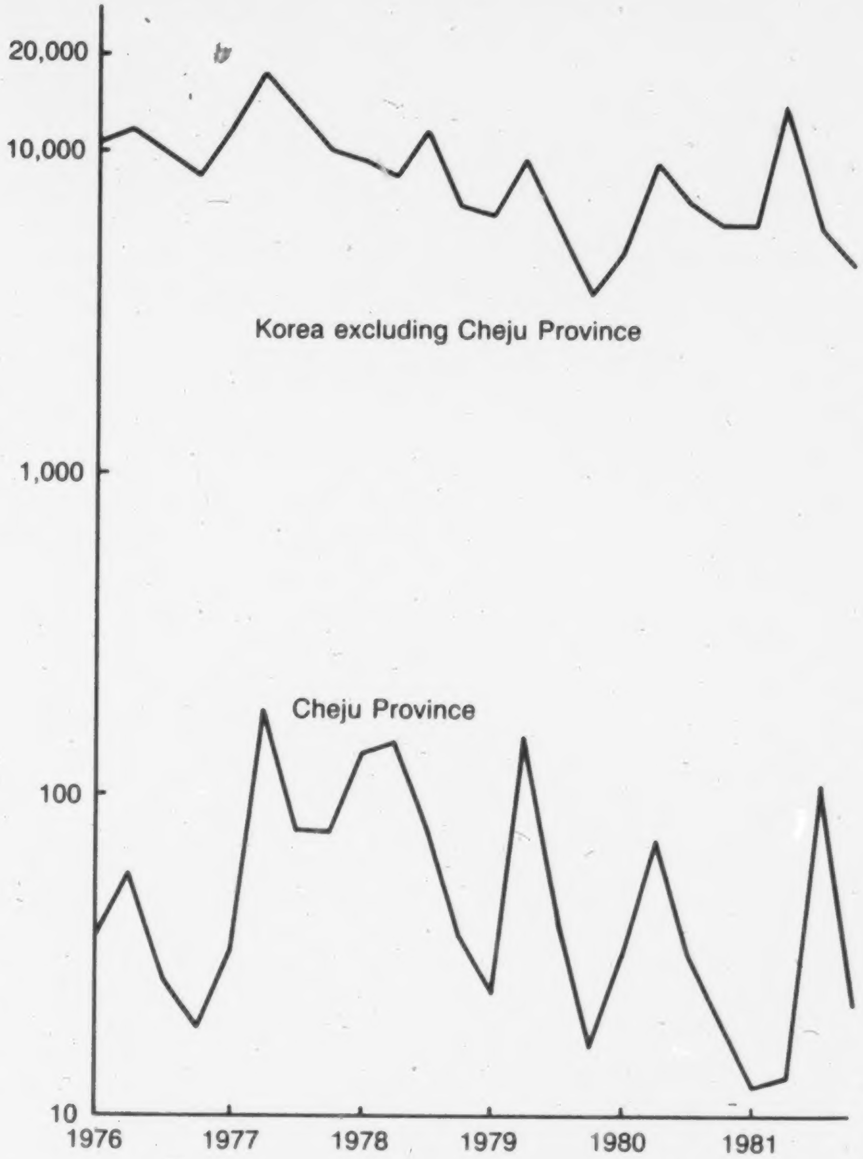

Figure 5. Number of acceptors: vasectomies, 1976–81

its early days) peaked in 1974 with over 350,000 insertions. With increases in female sterilization, the number of insertions stood at about 189,000 in 1979.

Female sterilization acceptance on Cheju rose from 76 in the first eight months of 1976 to 682 in the first four months of the KPPPES. This figure exceeded 2,000 the following year and demand remained high, although a slight downward trend became discernible in the middle of 1978. Nationwide, the government program reported 28,239 operations in 1976. This number rose to 181,445 in 1977, when the procedure became available at no cost to the acceptor. The annual figure later remained at about 190,000. Thus the sterilization component of the national program was successful, as it was in the Cheju project, when the financial burden of the operation was removed.

Cheju Province has always been a low-performance area for male sterilizations. The effect of the new delivery system on vasectomy acceptance is difficult to assess because acceptance oscillated rather severely. Acceptance figures in Sungsan Township, where there had been a test of the effect of charging fees for condoms and pills, did not differ noticeably from the acceptance levels in other townships.

Survey results

A clearer picture of the dramatic changes in contraceptive use in the experimental area emerges when data from the baseline and posttreatment surveys are compared (Table 5). In five years the percentage of women of ages 15–49 using contraceptives more than doubled in Cheju, increasing from 19 percent to 40 percent. During the same period contraceptive use also rose in Hapchun County, by 68 percent (from 27 to 45 percent), but not so remarkably. No directly comparable figures are available for Korea as a whole, but an approximation can be obtained by using data from the 1974 Korean National Fertility Survey (the Korean portion of the World Fertility Survey) and the 1979 Korean Contraceptive Prevalence Survey. The percentage of women currently using contraceptives for ages 15–44 (the 1979 survey did not interview women 45–49) increased by 53 percent—from 36

Table 5. Percentage of married women 15–49 years of age currently using contraceptives, by age and area: 1975 and 1980

	Cheju Province		Hapchun County		All Korea	
Age group	1975	1980	1975	1980	1974	1979
15–19	5	7	3	7	13	11
20–24	10	22	4	12	13	19
25–29	18	37	21	33	28	41
30–34	26	54	39	68	44	68
35–39	30	58	40	73	51	72
40–44	17	42	29	49	34	53
45–49	5	15	10	19	11	—
15–49	19	40	27	45	32	—

to 55 percent—between 1974 and 1979. For Cheju Province between 1975 and 1980, the increase for the same age range was more than 100 percent. Hence, Cheju's contraceptive use rates increased substantially faster than those of Hapchun or Korea as a whole.

It is true that more increase was possible for Cheju because its starting point was so low. The percentage differences in use in the respective five-year periods were only slightly higher in Cheju (between 2 and 3 percentage points higher) than in Hapchun and all Korea. Even with this fact taken into account, however, it is notable that at the end of the experimental period, contraceptive use rates in Cheju were approaching the same level as in Hapchun (40 percent in Cheju versus 45 percent in Hapchun for women of ages 15–49). Use levels in both Cheju and Hapchun nevertheless remained lower than the national average at the end of the experimental period.

As one might expect, given the fertility changes that occurred in Cheju, increases in contraceptive use were most marked in the two rural counties. In North County, current use among women of ages 15–49 doubled in five years, rising from 17 to 34 percent. In South county, it rose even more, from 18 to 41 percent. Even in Cheju City, current use increased from 23 to 43 percent—an 88 percent increase—over the same period.

All methods except the pill showed increases in use between 1975 and 1980 (Table 6). As expected from the service statistics, the most substantial change was in the percentage of women who opted for tubal ligation, which increased in both Cheju and Hapchun. At the end of the project, Hapchun had higher use rates for the IUD and male and female sterilization, and Cheju had higher rates for the pill (but only marginally), condoms, and other methods. Cheju's use percentages were higher than Hapchun's in the younger ages (up to age 30), but Hapchun's rates exceeded Cheju's for ages over 30 (data not shown). Current-use percentages standardized by age (using Cheju as the standard population) show that the differences in age distributions between the two areas were not important.

Cheju had an unusually high increase in the percentage of women who reported they had had one or more induced abortions. Whereas in 1975 only 14 percent of the women surveyed reported having had an abortion, by 1980 the proportion had risen to nearly 36 percent—a 152 percent increase in five years. Although use of induced abortion also increased for Hapchun over the same period, from 19 to 34 percent (or by 80 percent), and in the country as a whole between 1974 to 1979, from 30 to 48 percent (or by 58 percent), the increase was greatest in Cheju. The absolute percentage point increases in the respective five-year periods also showed higher increases in Cheju: 22 percent for Cheju, 15 percent for Hapchun, and 18 percent for all Korea. By 1980 the percentage of women ever having used induced abortion was higher in Cheju than in Hapchun, whereas the

Table 6. Percentage of married women 15-49 years of age currently using contraceptives, by method and area: 1975 and 1980

Method	Cheju City		North County		South County		Cheju Province		Hapchun County	
	1975	1980	1975	1980	1975	1980	1975	1980	1975	1980
Pill	6	6	6	5	5	6	6	6	8	6
Condom	3	5	1	2	2	2	2	3	2	1
IUD	7	8	8	8	8	8	8	8	12	11
Sterilization										
Male	1	3	1	2	0	2	1	2	2	4
Female	2	12	1	12	1	13	1	12	1	19
Other methods	3	9	1	6	2	9	2	8	2	4
All methods	23	43	17	34	18	41	19	40	27	45
Number of cases	4,753	4,725	3,661	3,034	5,370	4,725	13,784	12,484	4,920	2,595

reverse had been true in 1975. Neither Cheju nor Hapchun, however, attained the national level of abortion.

Summary of KPPPES's Accomplishments

In summary, the KPPPES appears to have been very successful in achieving its principal goals: contraceptive use increased markedly and fertility declined substantially. The primary purpose of the experiment was to determine the effect and efficiency of increasing the availability of contraceptive methods through a community-based family planning program. Characteristics peculiar to KPPPES's setting were that Korean fertility was already declining rapidly, the National Family Planning Program was one of the most successful in the world, and socioeconomic development was occurring rapidly in Korea. Whether unmet demand for contraception in such a society still existed owing to a lack of availability was being debated in the mid-1970s. Cheju itself, however, was lagging behind the rest of Korea in contraceptive use and fertility reduction. The project's contraceptive delivery system required only modest changes within the government program, so that little work would be needed to revise the national system in case the government wished to replicate the project elsewhere.

KPPPES was an unipurpose contraceptive distribution system; no integration with other health or social services was sought. Thus only the alleviation of barriers to contraceptive acceptance was considered. The implementation period for the delivery system was long—forty months—and the project was designed to measure a wide range of impacts: acceptance, practice, cost-effectivenenss, and fertility.

Project services were provided for all couples on the island, irrespective of their urban or rural residence. The characteristics of urban inhabitants and their reproductive behavior are usually different from those of rural people, and the project was expected to show differential responses to the community-based program according to the residence of clients.

Experience with the field operations and the preliminary results of administrative and survey data indicate the following findings:

- The new delivery system appears to have increased substantially the acceptance and prevalence of contraception.
- The fertility changes were marked throughout Cheju but most dramatic in rural Cheju.
- In rural areas the community-based distribution of contraceptives was apparently acceptable and effective.
- In urban areas, on the other hand, the experiment was less successful, and an alternative method to increase availability, such as social marketing, should be considered.

- Measured by cost per acceptor and couple-years of protection, the community-based distribution of contraceptives was comparable to or even superior to the national program in its cost-effectiveness.
- Monetary incentives for acceptors and canvassers seem to have had little effect on acceptance rates when the amount involved was small, but acceptance increased when the amount was substantial.

The next section presents a more direct evaluation of the effect of accessibility on increased contraceptive use and fertility decline in Cheju.

THE 1975 BASELINE SURVEY

In 1974 Ravenholt and Chao (1974:223) asserted that "the most important single factor in attainment of sharp fertility declines in developing countries today is the availability of more effective methods of fertility control distributed through vigorous nation-wide family planning programs." No situation yet exists, they argued, in which, despite the availability of all the most effective means of fertility control, contraceptive use has remained low and fertility has not rapidly declined. Nevertheless, a full account of the relationship between accessibility and contraceptive use has remained elusive. Studies that preceded the KPPPES (e.g., Rodriguez 1977) and studies conducted later (e.g., Chayovan, Hermalin, and Knodel 1984; Entwisle et al. 1984) have been hampered by having measures for few aspects of accessibility. A recent review by Nag (1984) indirectly documents that few studies have incorporated measurement of accessibility indicators along multiple dimensions. The KPPPES, in contrast, contained many measures of accessibility; but the measures were collected at the end of the experimental period, and few comparable measures were available from the beginning of the study. This difficulty notwithstanding, some interesting findings have emerged from multivariate analyses. Before proceeding to these results, however, it is instructive to review what is known of the situation in Cheju in 1975, prior to the beginning of the project.

Cheju in 1975

The Cheju baseline survey was conducted mainly for comparing data collected at the conclusion of the KPPPES with conditions existing before the project. Nevertheless, the baseline survey results are interesting in their own right because they describe an unusual situation at the start of the study. Basically, the situation was this: Cheju had substantially higher fertility rates and lower rates of contraceptive use than the rest of Korea at that time, for reasons that were not easily discernible from the survey data.

Recent fertility, as measured by own-children fertility estimates, was considerably higher in Cheju than in the rest of Korea. The higher fertility was due partly to higher marriage rates among Cheju women, and the number of children born to ever-married women was higher in Cheju for only three age groups—20–24, 35–39, and 40–44. (Childbearing outside of marriage is practically nonexistent in Korea.) Cumulative fertility was also higher in Cheju than nationally, except for women of ages 45–49 (Table 7).

For currently married women, a comparison of the 1976 national KIFP survey with the Cheju baseline survey data showed cumulative fertility differences similar to those for ever-married women (Table 8). The mean number of children ever born was higher in Cheju City than in other Korean cities among women 20–24 and 30–44 years of age but the same or lower in the remaining age groups. The rural figures for all of Korea exceeded those for the two Cheju counties at all ages except those under 25. Perhaps the fact that so many women in rural Cheju held jobs accounted for this. For the whole province, the comparison with the 1976 national data showed that cumulative fertility in Cheju was somewhat higher at ages 20–29 and 35–44, equal to the national averages at ages 15–19 and 30–34, and lower at ages 45–49. For all women between ages 15 and 49, the Cheju and national means were identical.

The mean ages at first marriage for currently married women were higher in Cheju Province than nationally for all age groups. Thus equal cumulative fertility levels in these age groups were the result of higher marital fertility since the average duration of marriage was less for Cheju women. As might be expected given the relative fertility levels, the use of

Table 7. Mean number of children ever born to all women and to ever-married women, by women's current age: Korea and Cheju Province, 1975

	Mean number of children ever born			
	All women		Ever-married women	
Age group	Korea	Cheju	Korea	Cheju
15–19	0.0	0.0	0.5	0.5
20–24	0.4	0.5	1.0	1.1
25–29	1.8	1.9	2.0	2.0
30–34	3.1	3.2	3.2	3.2
35–39	4.1	4.2	4.1	4.3
40–44	4.7	4.8	4.7	4.8
45–49	4.9	4.7	4.9	4.7
Total	2.2	2.4	3.4	3.4

Source: Calculated from Economic Planning Board (1976: table 3, pp. 108–110, 152–154).

Table 8. Mean number of children ever born to currently married women, by women's current age and area of residence: Korea and Cheju Province, 1975

Age group	Mean number of children ever born							
	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15–19	NC	NC	0.4†	NC	0.5*	0.6†	0.5*	0.5
20–24	0.9	0.9	1.1	1.1	1.1	1.1	1.0	1.1
25–29	1.8	2.0	2.0	2.2	2.1	2.1	2.0	2.1
30–34	2.8	3.1	3.2	3.7	3.4	3.4	3.3	3.3
35–39	3.5	3.8	4.2	4.6	4.5	4.5	4.1	4.4
40–44	4.1	4.6	5.0	5.4	5.2	5.3	4.9	5.2
45–49	4.9	5.7	5.3	6.1	5.5	5.6	5.8	5.5
Total	2.8	3.1	3.3	4.0	3.8	3.6	3.5	3.5

NC—Not calculated.

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

sterilization and other forms of contraception was much lower in Cheju than it was nationally. For the nation as a whole, 63 percent of currently married women between ages 15 and 49 had used contraception or sterilization in 1976. In Cheju only 25 percent of women had used sterilization or contraception (Table 9). Use rates in Cheju City were much lower than in the other cities of Korea, and both the rural counties of Cheju had lower rates of use than the national average for rural areas.

The prevalence of induced abortion in Cheju was also much lower than the national average (Table 10). (Induced abortion is legal in Korea under certain conditions. Even before it was legalized in the early 1970s, it was widely practiced and abortion providers were almost never prosecuted.) In Cheju City, one-fifth of currently married women had ever experienced an induced abortion, compared with half of such women in large cities of Korea and two-fifths in the other cities. In the rural areas of Cheju also, the use of induced abortion was low; prevalence rates in North and South Counties were one-fourth and one-half, respectively, of the national rural figure. For the whole province, the prevalence of induced abortion was just slightly more than one-third of the national level.

There was probably more underreporting of induced abortion in the Cheju data than in the national data because the Cheju baseline questionnaire did not include a full pregnancy history, relying instead on a single

Table 9. Percentage of currently married couples sterilized (husband or wife) or who had ever used contraception, by women's current age and area of residence: Korea and Cheju Province, 1975

Age group	Percentage sterilized (husband or wife) or who had ever used contraception							
	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15–19	NC	NC	10*	NC	8*	5†	10*	7
20–24	33	33	18	24	12	16	29	15
25–29	58	52	27	41	23	24	49	25
30–34	80	73	30	70	26	34	74	30
35–39	84	80	31	78	35	34	80	33
40–44	78	67	25	68	23	22	73	23
45–49	NC	NC	14	NC	10	9	NC	11
Total	68	57	26	59	23	25	63	25

NC—Not calculated because the number of cases in the denominator is fewer than twenty-one.

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

Table 10. Percentage of currently married women who had ever used induced abortion, by women's current age and area of residence: Korea and Cheju Province, 1975

Age group	Percentage who had ever used induced abortion							
	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15–19	NC	NC	2*	NC	0*	2†	7*	1
20–24	22	22	10	9	2	7	16	7
25–29	33	31	16	19	6	14	27	13
30–34	59	45	26	36	9	15	46	17
35–39	68	59	26	38	10	18	51	18
40–44	66	52	25	37	9	16	47	16
45–49	47	39†	15	29	6	6	35	9
Total	50	41	20	30	7	14	38	14

NC—Not calculated because number of cases in the denominator is fewer than twenty-one.

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

question to elicit whether the respondent had experienced an induced abortion. Even with this bias, however, it is clear that there was significantly less use of induced abortion in Cheju than in the nation as a whole.

Current use of contraception, including sterilization, was also very low in Cheju Province. For each area in Cheju and each age group, both current and past use levels were exceptionally low.

Couples using contraceptive methods in Cheju were using different methods from those Koreans throughout the country were using (Table 11). A higher percentage of the Cheju women were using the IUD or pill and a smaller percentage were using condoms, rhythm, sterilization, and other methods. If one defines the IUD, pill, and sterilization as more effective than the other methods, then three quarters of the Cheju women who were using contraception were using the more effective methods, whereas the national average (60 percent) was somewhat lower. Thus, although a smaller percentage of Cheju women than of Korean women were current users, those who were using a method were more likely to be using the more effective methods.

In sum, before the KPPPES, Cheju women had much lower rates of contraceptive use and induced abortion than their mainland counterparts.

Table 11. Percentage distribution of contraceptive methods currently used by married women 15–49 years of age, by area: Korea and Cheju Province, 1975

	Percentage currently using method							
Method	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
IUD	15	21	31	33	46	40	24	38
Pill	16	18	27	19	35	28	18	29
Condom	18	13	14	11	6	9	14	11
Rhythm	17	16	10	14	3	10	16	8
Tubal ligation	12	11	7	6	4	5	9	5
Vasectomy	11	10	5	8	3	1	9	3
Other	11	11	7	9	2	5	10	6
All methods	100	100	101	100	99	98	100	100
Number of cases	809	430	1,106	970	641	1,007	2,209	2,754

Note: Percentages for all methods may not sum exactly to 100 because of rounding. For Cheju, current users may have used more than one method concurrently; hence the sum of the percentages for each method may exceed 100. For the 1976 national data, only one of the methods currently used (the one considered more effective) was coded.

Several plausible explanations for this phenomenon are explored here and found to be inadequate.

Plausible Explanations for Low Contraceptive Use in Cheju

One possible explanation would be that the National Family Planning Program had been less active in Cheju than elsewhere. The baseline survey included a few questions that allowed comparison of program contacts in Cheju and the mainland.[3] Responses to these items do not suggest less program contact in Cheju, however; home visits by family planning workers appear to have been at least as prevalent, and perhaps more prevalent, there (Table 12). Home visits in Cheju appear to have been much less prevalent in South County—perhaps not as prevalent as the national average for rural areas if we take into account the longer reference period for the question asked in Cheju.

Table 12. Percentage of currently married women who had received a home visit from a family planning worker, by women's current age and area of residence: Korea and Cheju Province, 1975

	Percentage who had received a home visit[a]							
Age group	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15-19	NC	NC	22*	NC	23*	12†	20*	18
20-24	23	15	32	20	40	28	20	32
25-29	31	33	43	35	52	33	33	41
30-34	34	34	46	46	63	45	39	50
35-39	29	38	47	45	62	46	39	51
40-44	24	23	39	39	49	35	32	41
45-49	0	1†	24	0	40	19	0	27
Total	26	29	41	33	53	36	30	42

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

a. For Korea as a whole, respondents were asked about home visits in the past two years. For Cheju, no time limit was specified.

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[3] In the Cheju baseline survey, respondents were asked if a family planning worker had ever come to their home to talk about family planning. In the 1976 national survey conducted by KIFP, respondents were asked about home visits during the previous two years. The national and Cheju data thus are not strictly comparable but should serve to identify any gross differences in home visiting as of 1975.

A second possible explanation for lower contraceptive use in Cheju could be attitudinal differences between Cheju women and the rest of the nation. For example, if the Cheju women wanted more children and were disinclined to use family planning, then contraceptive use might be expected to be lower in Cheju than nationally. But the data do not support this explanation either. Instead they show very high levels of approval of family planning among Cheju women; furthermore, in each age group, about the same percentages of Cheju women wanted no more children as did other women in Korea (Table 13).[4]

A third possible explanation must also be rejected. If child mortality were significantly higher in Cheju than nationally, one might expect fertility to be higher there as a way to attain appropriate numbers of living children. We found, however, that childhood mortality in Cheju was somewhat

Table 13. Percentage of married women who wanted no more children, by women's current age and area of residence: Korea and Cheju Province, 1975

	Percentage who wanted no more children							
Age group	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15-19	NC	NC	12*	NC	10*	8†	7*	10
20-24	22	19	25	19	21	22	20	23
25-29	53	51	52	42	46	45	48	48
30-34	85	79	76	78	72	74	81	75
35-39	93	91	90	87	88	89	90	89
40-44	88	94	96	92	95	96	91	96
45-49	64[a]	73[a]	96	68[a]	98	98	68[a]	97
Total	70	69	71	68	73	71	69	71

NC—Not calculated because the number of cases in the denominator is fewer than twenty-one.

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

a. The national survey data included many "Don't know" responses for women of ages 45-49. Only 1 percent of women in all areas wanted more children.

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[4] Peter Donaldson has suggested that an ideational hypothesis might also be considered—that is, that fertility control was valued less highly in Cheju than on the mainland. The limited evidence we have (e.g., in Table 13) does not support this hypothesis, however.

lower than the national average and the mean numbers of living children in Cheju were similar to national averages (Table 14).

Low contraceptive use in Cheju might be attributed to differences in socioeconomic characteristics between Cheju couples and couples elsewhere in Korea. We explored this possibility by examining use rates in Cheju and nationally by age and selected socioeconomic characteristics, but the rates showed that socioeconomic differences did not account for lower use in Cheju (data not shown). In any given educational category, for example, Cheju women had lower use rates than the national average.

Baseline Survey Results in Hapchun

The baseline survey questions were also asked of women living in Hapchun County, the comparison area with Cheju. As Hapchun has no city, it is most appropriately compared with the two rural counties of Cheju.

Study of the Hapchun and rural Cheju data leads to conclusions similar to those we advanced when comparing national data with Cheju data: Cheju again stands out as having had lower use of fertility control, but the reasons do not appear to lie in differential program contact, attitudes, child survivorship, or socioeconomic characteristics as measured in the baseline survey (Table 15).

Table 14. Mean number of living children among currently married women, by women's current age and area of residence: Korea and Cheju Province, 1975

	Mean number of living children							
Age group	Korea, large cities	Korea, other cities	Cheju City	Rural Korea	Cheju, North County	Cheju, South County	All Korea	All Cheju
15–19	NC	NC	0.4†	NC	0.5*	0.5†	0.4*	0.5
20–24	0.9	0.9	1.1	1.1	1.1	1.0	1.0	1.1
25–29	1.8	1.9	2.0	2.1	2.0	2.0	1.9	2.0
30–34	2.7	3.0	3.1	3.5	3.3	3.3	3.1	3.2
35–39	3.3	3.5	4.1	4.2	4.3	4.3	3.8	4.2
40–44	3.7	4.2	4.8	4.9	4.8	4.9	4.5	4.8
45–49	4.2	4.9†	4.9	5.2	5.0	5.1	4.9	5.0
Total	2.6	2.9	3.1	3.6	3.6	3.4	3.2	3.4

NC—Not calculated because the number of cases in the denominator is fewer than twenty-one.

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

† Number of cases in the denominator is greater than fifty but fewer than 101.

Thus, after comparing the Cheju data with both national and Hapchun data, we found no satisfactory explanation for the low contraceptive use in Cheju in 1975. The explanation may lie outside the data collected through the very short baseline questionnaire used in Cheju and Hapchun. The central hypothesis of the KPPPES had to do with contraceptive accessibility. Perhaps the explanation for low contraceptive use in Cheju in 1975 also lies in that concept.

Private-sector Contraception

The private sector has played an increasingly important role in making contraception available to Korean couples. In 1966 one in five women who were using contraceptives obtained her supplies privately, but by 1976 half of the women using contraceptives were obtaining their supplies privately. The higher current use rates in all of Korea may have been due not only to the official National Family Planning Program but also to the private sector.

To explore this hypothesis, we calculated selected accessibility indicators. As shown in Table 16, the relative availability of family planning workers in Cheju was close to the national figures. Comparisons relating to the private sector, however, show dramatically lower accessibility in Cheju: per currently married woman between 15 and 49 years of age, there were many fewer doctors, pharmacies, and Mothers' Clubs in Cheju.

Tentatively, then, the most plausible explanation for lower contraceptive use in Cheju in 1975 is that contraceptive methods and services were less accessible through the private sector. Providing greater accessibility through the use of canvassers in the new delivery system may have supplemented the public-sector program sufficiently to compensate for the private-sector deficits in 1975.

Table 16. Selected indicators of family planning accessibility: Korea and Cheju Province: 1975

Accessibility indicator	Korea	Cheju
Number of MWCA per family planning worker	1,736	1,776
Number of MWCA per nonsupervisory family planning worker	2,160	2,105
Number of MWCA per pharmacy selling Western medicine	333	701
Number of MWCA per Mothers' Club	181	342
Number of MWCA per physician	455	835

MWCA—married women of childbearing age (currently married women 15-49 years of age). In 1975 these numbered 56,794 in Cheju and 5,120,396 in Korea.

Table 15. Selected fertility and family planning indicators for currently married women, by women's current age and area of residence: Rural Cheju and Hapchun County, 1975

Area and age group	Mean number of live births	Mean number of living children	Percentage pregnant at the interview date	Percentage who had ever used contraception[a]	Percentage who had ever used induced abortion	Percentage currently using contraception[a]	Percentage who had been visited by a family planning worker	Percentage not wanting more children	Mean age at first marriage
Rural Cheju									
15–19	—	—	3	6	1	4	16	9	17.8
20–24	1.2	1.1	23	14	5	9	32	22	20.6
25–29	2.1	2.0	15	24	11	17	40	45	22.0
30–34	3.4	3.3	7	31	13	23	52	74	22.1
35–39	4.5	4.3	4	34	14	29	53	88	21.6
40–44	5.3	4.8	1	23	13	16	41	96	20.8
45–49	5.5	5.0	0	10	6	4	28	98	19.7
Total	3.7	3.5	8	24	11	18	43	72	21.3
Hapchun County									
15–19	0.5*	0.4*	31*	6*	0*	3*	16	25*	17.2*
20–24	1.0	1.0	30	9	6	4	32	19	20.2
25–29	2.6	2.5	18	28	12	21	42	55	20.0
30–34	3.9	3.7	6	36	22	39	50	83	19.3
35–39	4.9	4.6	3	39	26	40	50	93	18.4
40–44	5.4	4.9	1	45	23	30	45	96	17.4
45–49	5.9	5.2	0	21	14	10	35	97	16.6
Total	4.3	3.6	7	30	19	27	44	79	18.5

* Number of cases in the denominator is greater than twenty but fewer than fifty-one.

a. Including sterilization but not abortion.

THE 1980 INTENSIVE SURVEY

The major source of information on the effects of accessibility on fertility control is the intensive survey taken in 1980 in conjunction with the posttreatment survey discussed earlier. Although it would have been useful to conduct an intentive survey with the baseline survey and one was proposed, neither the funding agency (USAID) nor the Korean government was able to fund such a project. Readers will realize the problems posed by an assessment based on only a postexperimental measurement of the full range of accessibility indicators. Nevertheless, some of the retrospective results are of interest.

The Questionnaire

The intensive survey was conducted in twenty enumeration districts each in Cheju Province and Hapchun County, using a structured interview questionnaire.[5] Many of the items in that survey were taken from other Korean surveys: the 1971 Korean Institute for Research in the Behavioral Sciences (KIRBS) Family Life Survey (reported in Chung et al. 1972); the 1974 Korean Fertility Survey, which was part of the World Fertility Survey (or WFS); the 1976 KIRBS Value of Children Study; the 1975 KPPPES baseline survey; and the pre- and postaction surveys of the Euiryong phase of the KPPPES. To enhance comparability, the exact Korean wording in the source survey was retained in the 1980 survey whenever possible. In a few cases, however, wording changes were necessary because of changes in format or because the investigators agreed that the original wording was misleading or awkward.

The final questionnaire of 223 questions resulted from two pretests and extensive changes from the first draft of more than 350 questions.[6] The basic guideline its authors followed in writing the questionnaire was to try to frame measures of each type of accessibility: cognitive, geographic, economic, affective, and program quality (which includes administrative aspects). Measurement of four types of accessibility was straightforward. Cognitive accessibility was measured by whether the respondents had heard of specific contraceptive methods, knew how to use them, and knew where to get either the methods or advice about them. Geographic accessibility was measured by respondents' knowledge of where and how convenient were the places to obtain the methods. Economic accessibility was measured by the methods' monetary costs and respondents' perceptions of the reasonableness of those costs. Program quality was measured by convenience of clinic hours, the perceived helpfulness of service workers, and related questions.

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[5] A copy of the questionnaire may be obtained from James A. Palmore at the East-West Population Institute.

[6] For comparison, the Korean Fertility Survey (WFS) of 1974 had 400 questions and the KIRBS 1971 Family Life Survey had 251.

Affective accessibility was the most difficult to measure because the concept can cover a very wide range of psychosocial phenomena. The questionnaire's authors ultimately decided to select from previous research concepts and measures that had been found in Korea and elsewhere to be most closely related to fertility control. The measures included were a subset of the Value of Children Study questions; a modified form of a pregnancy attitudes scale originally designed by Warren B. Miller; fertility preference measures including the Coombs number and gender preference scales; measures of "social climate," "birth control press," and "birth control persuasion" modified from the 1971 KIRBS Family Life Survey; some items on contraceptive attitudes that incorporated material from several surveys; information on birth control discussions, opinion leadership, and social networks largely taken from previous research by Palmore (e.g., Palmore et al. 1976, 1977b); items on exposure to various mass media; and information on the perceived safety of various contraceptive methods.

Field Work, Coding and Editing, and Data Quality

Field work was carried out somewhat differently in the two sites, with the Cheju Development Institute responsible for the work in Cheju and Dong-A University in Pusan responsible for the Hapchun survey. Field work took place in November 1980. The two site directors met frequently and visited each other's sites to assure comparability and quality. In addition, three of the authors of the present report, along with their Korean collaborators, made frequent visits to both sites to check on training, editing, and the like.

Coding, initial editing by hand, and punching of the data for both Cheju and Hapchun were done at Dong-A University. Preliminary editing of the computer tape was undertaken at the Bureau of Statistics, Economic Planning Board, in Seoul, and final editing was done at East-West Population Institute.

The data quality was high as assessed both in the editing process and also by selected spot-checking. The interviewers for the posttreatment survey intensive questionnaires generally did very good work. Supervisors at both sites were experienced survey directors, and they were assisted by other excellent personnel, both short-term consultants and also their regular staffs. The sample design and the response rates were up to international standards (exceeding 95 percent response rates), the questionnaire found to be well constructed and translated, and the field work, coding, and editing carefully undertaken.

Effect Measures

To measure the effect of accessibility, we constructed various proportions for measuring contraceptive acceptance since the beginning of the new delivery system in 1976. These measures are as follows:

- AFTER A: use of contraceptives or induced abortion on or after September 1976 among ever-married women 15–49 years of age who had never used either of those methods prior to that date.
- AFTER B: use of contraceptives on or after September 1976 among ever-married women 15–49 years of age who had never used contraceptives prior to that date.
- AFTER C: use of program contraceptives on or after September 1976 among ever-married women 15–49 years of age who had never used program contraceptives prior to that date.
- AFTER D: use of program contraceptives or induced abortion on or after September 1976 among ever-married women 15–49 years of age who had never used either of those methods prior to that date.
- AFTER E: use of contraceptives on or after September 1976 among ever-married women 15–49 years of age who had never used them previously or who had stopped using them before September 1976.
- AFTER F: use of contraceptives or induced abortion on or after September 1976 among ever-married women 15–49 years of age who had never used either previously or who had stopped using contraceptives before September 1976.

These measures were all aimed at measuring the expected effects of the program. Each relates an outcome in the numerator to the population exposed to the risk of that outcome. To examine the relationship of the accessibility measures to the effect measures, we performed multivariate analyses.

Changes in Fertility Control Measured by the Survey

By 1980, contraceptive use in Cheju had increased dramatically and was approaching that in Hapchun. Table 17 summarizes for Cheju and Hapchun the results of the six AFTER measures, representing changes in fertility control that had occurred since September 1976 as measured retrospectively in 1980. Several of the results require comment.

First, Cheju and Hapchun were nearly identical with respect to AFTER A, C, and F—all of which include induced abortion as well as contraception and sterilization. Thus nonprogram methods (including induced

Table 17. Measures of contraceptive use among ever-married women 15–49 years of age: Cheju and Hapchun, September 1976 to November 1980

Measure	Never used or had not used since September 1976	Used since September 1976	Number of cases
AFTER A			
Cheju	46	54	622
Hapchun	43	57	609
AFTER B			
Cheju	59	41	652
Hapchun	45	55	613
AFTER C			
Cheju	72	28	849
Hapchun	68	32	948
AFTER D			
Cheju	63	37	849
Hapchun	68	32	948
AFTER E			
Cheju	64	36	733
Hapchun	53	47	719
AFTER F			
Cheju	52	48	703
Hapchun	52	48	715

abortion) were playing a substantial role by the end of the study period in Cheju and Hapchun. That was not the situation in 1975, as we have already discussed.

Second, the measure particularly aimed at assessing the effects of program contraception (AFTER C) shows a similar rate for Cheju and Hapchun, indicating a very different situation in Cheju by 1980 from the one that prevailed prior to the study, when it lagged behind other areas in the use of program contraceptives.

Third, the three most comprehensive measures of changes in fertility control (AFTER A, AFTER D, and AFTER F) showed Cheju's performance to be at least as good as Hapchun's. More of those exposed to the risk of unwanted fertility in Cheju than in Hapchun had taken appropriate action during the assessment period for measures D and F and only slightly fewer had done so for measure A.

Examination of the same measures by broad age groups (15–29, 30–39, and 40–49) revealed that the changes in Cheju were particularly marked for the youngest women (data not shown).

Accessibility and the AFTER measures

What is not yet clear is the extent to which increased accessibility, measured at the microlevel, was responsible for the changes in fertility control observed from the 1980 intensive survey. Unfortunately, much of our knowledge about this question is based on measures of accessibility at the time of the posttreatment survey. We had to infer from those data what changes might have taken place during the program period. This was accomplished in several steps.

The first step involved examining the relationship of each accessibility measure to each AFTER measure. Our analyses revealed that almost all of the accessibility indicators were related to the AFTER measures in both Cheju and Hapchun. Not all showed equally strong relationships, however. The appendix tables show the accessibility measures that had zero-order correlations of 0.15 or above with the various AFTER measures. Even with the restriction of a zero-order correlation of 0.15 or above, a large number of accessibility measures were found to be related to the AFTER indices. Study of the full correlation matrices revealed that the accessibility measures were themselves associated. Hence multivariate analysis was desirable.

Multivariate assessment

Multivariate analysis was done in several stages. After recoding variables that were nominal or ordinal into indicator random variables, we used all of the measures for one type of accessibility as independent variables and the various AFTER measures as dependent variables.[7] This led to sixty sets of regression analyses—six AFTER measures, five sets of independent variables (measuring accessibility), and two areas (Cheju and Hapchun).

We then selected all independent variables with a beta value exceeding 0.1 for the next stage of the analysis. The choice of 0.1 eliminated very small net effects. Although the most defensible procedure would have been to keep all of the variables for the final analyses, there were far too many indicators to include them all together in one huge set of regressions.

The final step was to combine the measures for all types of accessibility with the sociodemographic measures into one set of regressions for each AFTER measure. These analyses were performed using regression by leaps and bounds (Furnival and Wilson 1974), a procedure available in the BMDP software package (Dixon 1981). In the BMDP package, these analyses are labeled "best subsets" regressions (see section 13.3 of Dixon 1981). From many hundreds of regression analyses we obtained twelve best subsets, using Mallows's C_p as the criterion for selection (Daniel and Wood 1980). Results of the twelve subsets are shown in Tables 18 to 24.

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[7] Variables that were very highly skewed (e.g., a question to which almost every respondent gave an affirmative response) were eliminated before we performed the regression analyses.

All of the variables used in the regressions were selected initially because they had theoretical relationships with the dependent variables. We chose regression by leaps and bounds in order to summarize a large set of relationships in the most parsimonious way. As John Ross has commented (personal communication), theory led us to select the variables we included, but the empirical data had a voice of their own.

Step-wise regressions were also undertaken but are not reported here, in part because the results were sufficiently similar to those from the leaps

Table 18. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER A as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER A	Cheju Province	Hapchun County
R^2	0.5351	0.5388
Age	-0.0057	-0.0137
Husband or respondent is too old to have another child	-0.0424	
Know how to use tubal ligation	-0.0729	
Know how to use IUD	0.0777	0.1252
Know how to use induced abortion	0.1052	0.0630
Cost of abortion	0.1107	0.1527
Prefer a male contraceptive method	0.1055	
Most important thing about contraception is that it makes sex worry-free and enjoyable	0.0458	
Visited some place or someone for contraceptive advice	0.1949	0.2310
Canvasser or family planning worker was helpful	0.0109	0.0597
Heard about family planning from husband	0.0461	
Recommended contraceptive to friend or neighbor	0.1370	0.1314
Hours of contraceptive services are satisfactory	0.0940	0.0831
Cost of contraceptives is reasonable	0.2058	0.1031
Cost of tubal ligation and IUD is reasonable	0.1465	0.1075
Urban or rural residence	0.0522	
Number of modern objects in the house		0.0309
Wanted last or most recent pregnancy	-0.1661	-0.2612

Table 19. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER B as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER B	Cheju Province	Hapchun County
R^2	0.3862	0.5054
Age	-0.0059	-0.0130
Know how to use IUD	0.0799	0.1762
Know how to use induced abortion	-0.0622	
Cost of abortion		0.1394
Prefer a male contraceptive method	0.1064	0.0364
Visited some place or someone for contraceptive advice	0.1802	0.1726
Canvasser or family planning worker was helpful	0.1064	0.0675
Heard about family planning from husband	0.0631	
Recommended contraceptive to friend or neighbor	0.1577	0.1297
Hours of contraceptive services are satisfactory		0.0620
Cost of contraceptives is reasonable	0.2404	0.1281
Cost of tubal ligation and IUD is reasonable	0.1410	0.1091
Number of modern objects in the house		0.0221
Wanted last or most recent pregnancy	-0.1416	-0.2576

and bounds procedure that it would be redundant to present them, and also because, given the aims of this analysis, regression by leaps and bounds is the more statistically justifiable procedure. Regression by leaps and bounds selects, by the criterion chosen (in this case C_p), that subset of variables which maximizes the criterion (i.e., is the "best") for "explaining" the dependent variable while including all of the independent variables in the analysis.

Results of the multivariate analyses lead to several observations and speculations.

First, it is striking that the explained variance (R^2) for most of the analyses was very large. R^2 for AFTER A was above 0.5 for both Cheju and Hapchun. As AFTER A is the measure all first-time use (contraceptives, sterilization, and induced abortion) since 1976, this value is important. R^2 for the other AFTER measures is generally smaller and is as low (relative to the others but not absolutely) as 0.22 for AFTER C.

Second, the results point to the importance of nonprogram contraception and the use of induced abortion. The accessibility measures relate more

Table 20. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER C as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER C	Cheju Province	Hapchun County
R^2	0.2212	0.2857
Age	-0.0119	-0.0162
Husband or respondent is too old to have another child		-0.0512
Know how to use tubal ligation		0.0803
Know how to use IUD	0.0584	
Know how to use induced abortion	-0.0587	
Cost of abortion		0.0631
Prefer a male contraceptive method	0.0507	
Visited some place or someone for contraceptive advice	0.0962	0.1431
Canvasser or family planner worker was helpful		0.0502
Heard about family planning from husband	0.0448	
Recommended contraceptive to friend or neighbor	0.0908	0.0696
Hours of contraceptive services are satisfactory		0.0430
Cost of contraceptives is reasonable	0.1520	
Cost of tubal ligation and IUD is reasonable	0.0900	0.0985
Urban or rural residence		0.0632
Interested in finding work now or in the future	-0.0392	
Wanted last or most recent pregnancy	-0.1157	-0.1874

strongly to the overall changes in fertility control than they do to program methods alone. A separate study of drugstores in Cheju (Moon Sik Hong 1979) corroborates rapid increases in nonprogram contraception during the study period.

Third, accessibility measures were important in both Cheju and Hapchun in explaining the AFTER measures. This was true even after the sociodemographic measures were controlled for.

Fourth, although accessibility indicators explained some variance in both Cheju and Hapchun, their effect was more prevalent in Cheju for AFTER A, the measure for change in first-time use. In Hapchun, sociodemographic variables were more important than in Cheju. One might describe this phenomenon as the "sociodemographic democratization" of fertility con-

Table 21. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER D as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER D	Cheju Province	Hapchun County
R^2	0.2728	0.3016
Age	-0.0162	-0.0169
Husband or respondent too old to have another child		-0.0604
Know how to use tubal ligation		0.0881
Know how to use IUD	0.0614	
Cost of abortion	0.0776	0.0686
Prefer a male contraceptive method	0.0459	
Visited some place or someone for contraceptive advice	0.1148	0.1607
Canvasser or family planning worker was helpful		0.0470
Heard about family planning from husband	0.0417	
Recommended contraceptive to friend or neighbor	0.0608	0.0748
Hours of contraceptive services are satisfactory		0.0459
Cost of contraceptives is reasonable	0.1406	
Cost of tubal ligation and IUD is reasonable	0.0991	0.0934
Urban or rural residence	0.0427	0.0464
Wanted last or most recent pregnancy	-0.1099	-0.1886

trol in Cheju. For the AFTER A dependent variable, five more accessibility indicators were present in the "best" subset for Cheju than in the "best" subset for Hapchun. Furthermore, two of the coefficients for the sociodemographic indicators were larger in Hapchun than in Cheju: the age coefficient was twice as large in Hapchun, and there is a coefficient for the number of modern objects in Hapchun but not in Cheju. The only exception to this generalization for the AFTER A measure was the urban-rural residence variable, which was important for Cheju but not for Hapchun (which has no city). As we have already noted, the new delivery system did not seem to be as effective in the urban parts of Cheju as in the rural areas.

The fourth generalization is not as clear for the remaining AFTER measures but still may be justified. For AFTER B, for example, the number of accessibility indicators in the "best" subsets was equal for the two areas, but only for Hapchun did the variable for the number of modern objects

Table 22. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER E as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER E	Cheju Province	Hapchun County
R^2	0.3119	0.4254
Age	-0.0101	-0.0188
Know how to use tubal ligation		0.0716
Know how to use IUD		0.0613
Know how to use induced abortion	-0.0578	
Cost of abortion		0.0966
Prefer a male contraceptive method	0.0814	0.0349
Visited some place or someone for contraceptive advice	0.1613	0.1490
Canvasser or family planning worker was helpful	0.0664	0.0557
Heard about family planning from husband	0.0851	
Recommended contraceptive to friend or neighbor	0.1576	0.1281
Cost of contraceptives is reasonable	0.1863	0.0944
Cost of tubal ligation and IUD is reasonable	0.1373	0.1234
Number of modern objects in the house		0.0212
Wanted last or most recent pregnancy	-0.1402	-0.2369

have a coefficient. Furthermore, the age coefficient was again larger for Hapchun.

Fifth, it is startling that the affective accessibility measures accounted for only a minor proportion of the "best" subsets for Cheju or Hapchun. Given the large number of such measures that were included in the questionnaire, one would expect, even by chance, a large number in the final analyses. Such was not the case. It is also noteworthy that no measures of geographic accessibility appeared in the "best" subsets. Instead, more of the cognitive, economic, and program-quality measures were in the final "best" subsets—relative to the number of items included in those areas. For all the AFTER measures, the number of indicators found for each type of accessibility in at least one of the "best" subsets was:

cognitive	3
economic	3
geographic	0
program quality	2
affective	6

Table 23. R^2 and the raw score regression coefficients of the "best subsets" regression analysis, AFTER F as the dependent variable: Cheju and Hapchun 1980 intensive survey

AFTER F	Cheju Province	Hapchun County
R^2	0.3990	0.4505
Age	-0.0118	-0.0195
Husband or respondent is too old to have another child	-0.0420	
Know how to use tubal ligation		0.1080
Know how to use induced abortion	0.0580	
Cost of abortion	0.0717	0.1148
Prefer a male contraceptive method	0.0714	
Visited some place or someone for contraceptive advice	0.1783	0.1891
Canvasser or family planning worker was helpful	0.0573	0.0523
Heard about family planning from husband	0.0870	
Recommended contraceptive to friend or neighbor	0.1367	0.1371
Hours of contraceptive services are satisfactory	0.0560	0.0533
Cost of contraceptives is reasonable	0.1554	0.0577
Cost of tubal ligation and IUD is reasonable	0.1423	0.1221
Number of modern objects in the house		0.0266
Wanted last or most recent pregnancy	-0.1531	-0.2373

In addition, five sociodemographic indicators were found in at least one of the "best" subsets. This result suggests that future research, at least in Korea, may be able to use a much shorter "accessibility module" than the detailed KPPPES intensive survey set.

Sixth, the accessibility measures that did appear in the final "best" subsets reassert the importance of personal networks and interpersonal communication in the adoption of fertility control. This was also the main assertion of Joung-Im Kim and Palmore (1984), using a different methodology and data from the Euiryong phase of the study, and it has been found also in several earlier studies in Korea (e.g., Chung et al. 1972; Palmore et al. 1976, 1977b) and elsewhere (Retherford and Palmore 1983). For both Cheju and Hapchun, these measures were important.

Seventh, the role of husbands appears to have been more important in Cheju than in Hapchun. The variable "heard about family planning from husband" appeared in the "best" subset for Cheju for all six AFTER meas-

Table 24. Percentage of married women 15–49 years of age, by age of woman, who stated they had been contacted by a canvasser, family planning worker, or other health center personnel about family planning: Cheju and Hapchun, 1975 and 1980

	1975		1980	
Age group	Cheju Province	Hapchun County	Cheju Province	Hapchun County
15–19	30	30	49	29
20–24	42	45	50	60
25–29	53	56	63	75
30–34	62	65	74	85
35–39	63	67	73	89
40–44	53	61	68	79
45–49	38	46	56	70
15–49	54	59	65	78

ures, but not for Hapchun. The attitude item "respondent would prefer a male contraceptive method" also appeared in the "best" subset more often in Cheju than in Hapchun.

Eighth, the item "canvasser or family planning worker was helpful" appears in the "best" subset for all six AFTER measures for Hapchun but not Cheju. This is an initially puzzling finding, but it relates closely to another anomaly.

A principal goal of the program was to make contraceptives more accessible mainly through the use of canvassers. One would expect, hence, that a very high percentage of Cheju women would have been contacted by canvassers or family planning workers and would remember that contact. The data do not show this to be true, however. A smaller proportion of Cheju women than of Hapchun women (65 versus 78 percent) claimed to have been contacted by 1980, and this was true for every five-year age group except ages 15–19 (Table 24). Moreover, the relative positions of Cheju and Hapchun had shifted between 1975 and 1980, becoming even more favorable to Hapchun than before the new delivery system was implemented in Cheju. Since 100 percent of the households in Cheju were supposed to have been contacted in 1976, these results seem very strange. Reported contact rates should have been much higher in Cheju.

One explanation for these findings is that the canvassers were neighbors of women in Cheju. Visits by neighbors, who would probably not identify themselves as canvassers, would not be viewed as program contacts by the Cheju women. The measure "visited someplace or someone for contraceptive advice" was part of the "best" subset for every AFTER measure for Cheju as well as Hapchun, and other measures of accessibility (which indicate probable contact by the canvassers) were explanatory in Cheju as well as in Hapchun. The personal network measures, mentioned previously, were probably to some extent inclusive of the canvassing by neighbors.

CONCLUSION

The survey data revealed dramatic changes in fertility control and fertility itself in Cheju over the life of the KPPPES, particularly in the rural areas. The extent to which these changes were due to increased accessibility is not directly measurable at the microlevel because the type of information collected in the 1980 intensive survey was not available in 1975 at the start of the data collection. It is demonstrable that accessibility as measured in 1980 was related to retrospective measures of changes in fertility control, but this finding applies to both Cheju and Hapchun and must be qualified with the caveat that a more scientifically accurate approach would have been to relate measures of changes in accessibility to changes in fertility control. One must also remember that Hapchun was in no sense a true control area because an active government program existed there as well.

These qualifications aside, however, the macrolevel changes in Cheju, combined with the microlevel results, do suggest that accessibility of birth control knowledge and methods is strongly related to fertility control in Korea, and that Cheju joined other parts of Korea in a rapid fertility transition.

What are the implications of the Cheju experience for other family planning programs? We speculate that several features of the KPPPES could be highly useful elsewhere: a full "cafeteria approach" to method choice; removal of economic, geographic, cognitive, affective, and administrative barriers to accessibility; a greatly increased worker-to-client ratio for contacting and encouraging couples to use contraception, supplemented by changes in the structure of fees, transportation, and training; and the removal of a target system that provided "ceilings" as well as "floors" to acceptance levels. The depot system, in the canvassers' homes in rural areas, was another important change.

The National Family Planning Program was already offering a cafeteria approach to the distribution of contraceptives, and that approach proved to be very important to the success of the KPPPES. In addition, three innovations of the KPPPES seemed to be most vital to its success in the Korean context: the changes in fees charged to acceptors, the changes in worker-to-client ratio combined with the use of rural supply depots, and the changes in the target system.

The importance of abolishing fees charged to acceptors of female sterilization was undoubtedly great but difficult to assess scientifically because only months after KPPPES made this change the National Family Planning Program also made sterilization free to acceptors by fully reimbursing physicians for the procedure. (Previously the acceptors had had to pay two-thirds of the cost.)

The supply depots and the addition of the many canvassers who made personal contact with couples and kept supplies in their own homes were also an important change. Admittedly, a radical increase in canvassers, with each canvasser responsible for only 150 eligible couples, is expensive and may be too costly for some countries. That Cheju moved from very low prevalence rates in 1975 to being on the verge of modern levels of contraceptive use in 1980, however, strongly suggests that the investment, if affordable, may be worthwhile.

Suspension of the target system in Cheju was a crucial part of the experiment. Many family planning program administrators have argued that target systems are essential to a successful family planning program. The Cheju project demonstrated that a program can be highly effective without a target system.

APPENDIX:
Accessibility Measures Having Significant Correlations with AFTER Measures

The following tables present the measures of family planning accessibility that had zero-order correlations of 0.15 or above with various measures (called AFTER measures) of contraceptive acceptance during the period between September 1976 and November 1980. An alpha-numeric sequence is used to identify the tables. Each number represents a type of accessibility measure—1, affective; 2, cognitive; 3, economic; 4, geographic; 5, program quality; and 6, background or sociodemographic. Each letter represents an AFTER measure, described in the table's title. The tables compare correlations in Cheju Province and the comparison area, Hapchun County.

Variables that were categorical or ordinal had to be recoded into indicator random variables for the correlation analyses. For readers unfamiliar with the term "indicator random variables," these are often called "dummy variables." What is involved is converting variables measured at the nominal or ordinal level of measurement into one or more dichotomous variables coded 0 and 1. In this recoding, 0 equals absence of the characteristic in question and 1 equals having that characteristic.

Table 1A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER A)

Measure of affective accessibility	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	55	57
R or husband is too old for another child								
Important	†	†	65	80	29	37	46	51
Not Important	55	43	71	84	36	40	58	60
Is tubal ligation or IUD safe for a woman?								
Yes	80	52	87	85	64*	60	81	71
No	45	24	59	72*	23	13	44	30
Is induced abortion safe for a woman?								
Yes	†	67*	86*	93	65	53*	78	75
No	52	34	65	79	26	35	50	52
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	54	50	74	85	47	55	60	67
Disagree	58*	21	57	77	15	26	41	43
Did R desire more children before becoming pregnant with last child?								
Yes	52	31	56	62	29	24	49	38
No	†	†	90	95	34	53	69	80
Friends, relatives, neighbors using contraceptives?								
Many	66	52*	76	88	60*	56	70	72
None or few	49	35	63	78	22	31	46	49
Does R's husband know a lot about contraceptive methods?								
Yes	64	43	77	85	60*	54	69	64
No	44	32*	60	79	23	30	42	48
Does R's husband talk about contraception with her?								

Yes	57	44	76	85	51*	54	64	65
No	47	21*	55	78	24	26	40	43
Has R advised young couples to have only adequate number of children?								
Yes	64	58*	72	84	34	45	60	65
No	48	31	63	80	29	30	48	48
Has R recommended family planning to people with many children?								
Yes	67	60*	76	87	44*	47	67	69
No	47	32	63	77	26	30	47	46
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	87*	†	92	92	†	73*	89	85
No	47	35	63	80	28	33	48	52
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	83*	†	†	†	81*	†
No	53	39	67	82	30	38	52	56
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	90*	83*	92	94	92*	66	91	85
No	45	29	58	71	27	29	44	42
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	96*	†	†	†	96*	95*
No	51	38	66	81	30	35	51	54
Has R visited other women with intent to tell them about contraceptive methods?								
Yes	†	†	†	100*	†	†	†	85
No	54	39	68	80	31	36	54	54
Do R's friends, neighbors envy a family with many children?								
Yes	40*	†	47*	82*	21*	12*	36	45
No	57	41	72	82	34	42	58	58

† Sample size 0–24. * Sample size 25—49.

Table 1B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER B)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of affective accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	39	38	56	81	21	37	41	55
R or husband is too old for another child								
Important	†	†	57	80	18	36	36	50
Not important	38	41	56	81	26	38	43	59
Is tubal ligation or IUD safe for a woman?								
Yes	62	50	71	83	48*	59	64	70
No	29	24	48	70*	14	12	32	28
Is induced abortion safe for a woman?								
Yes	31*	67*	67*	91	31*	53*	47	74
No	39	32	54	78	19	33	40	51
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	39	48	61	85	29	54	46	66
Disagree	37*	21	46	74	12	25	31	41
Did R desire more children before becoming pregnant with last child?								
Yes	36	29	45	61	20	22	35	36
No	†	†	73	93	22	52	53	78
Friends, relatives, neighbors using contraceptives?								
Many	47	50	64	86	32*	56	52	71
None or few	34	34	49	77	17	29	34	47
Does R's husband know a lot about contraceptive methods?								
Yes	44	41	63	85	40*	50	52	62
No	32	32*	48	76	15	30	32	47

Does R's husband talk about contraception with her?								
Yes	43	42	63	84	35*	50	50	63
No	25	21*	43	74	15	26	27	42
Has R advised young couples to have only adequate number of children?								
Yes	51	58*	63	86	29	46	52	68
No	31	31	50	75	17	29	34	44
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	64*	†	74	92	†	73*	68	84
No	32	34	51	78	19	32	35	50
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	†	†	†	†	68*	†
No	36	38	54	80	20	36	39	54
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	71*	80*	79	93	57	62	74	83
No	29	28	45	69	18	29	31	41
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	73*	†	†	†	75*	95*
No	35	37	54	80	20	33	38	53
Has R visited other wor[illegible]n with intent to tell them about contrac[illegible]thods?								
Yes	†	†	†	97*	†	†	†	82
No	38	38	55	78	20	34	40	52
Do R's friends, neighbors [illegible] family with many children?								
Yes	33*	†	41*	82*	17*	12*	30	43
No	39	40	58	81	22	40	43	57

† Sample size 0–24. * Sample size 25–49.

Table 1C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER C)

Measure of affective accessibility	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	28	32
R or husband is too old for another child								
Important	†	†	39	48	10	13	23	23
Not important	32	34	40	58	14	17	32	39
Is tubal ligation or IUD safe for a woman?								
Yes	57	43	47	58	18	19	40	38
No	24	17	36	40	9	4	23	16
Is induced abortion safe for a woman?								
Yes	30*	58*	44	60	17	20	30	42
No	34	26	39	52	10	13	28	29
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	33	39	44	54	14	17	31	36
Disagree	36*	19	31	54	8	12	22	25
Did R desire more children before becoming pregnant with last child?								
Yes	31	24	32	36	12	8	26	20
No	54*	76*	52	66	11	21	34	44
Friends, relatives, neighbors using contraceptives?								
Many	41	43*	43	63	14	21	34	44
None or few	29	28	36	48	10	12	25	26
Does R's husband know a lot about contraceptive methods?								
Yes	37	36	43	55	15	15	34	35
No	29	24	35	54	10	14	24	27
Does R's husband talk about contraception with her?								

Yes	37	35	44	55	16	16	35	36
No	22	17*	32	53	9	12	19	24
Has R advised young couples to have only adequate number of children?								
Yes	38	44	40	55	12	16	30	34
No	29	26	38	54	12	11	27	29
Has R recommended family planning to people with many children?								
Yes	42	25	41	56	13	16	32	36
No	28	49*	38	53	11	12	26	28
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	52	†	48	56	15*	20	42	39
No	28	30	37	54	11	13	25	30
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	43*	†	†	†	38	27*
No	32	32	39	55	11	14	28	32
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	59	66*	52	62	18*	16	46	42
No	26	24	33	46	11	13	23	25
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	47*	60*	†	27*	49	44
No	30	31	38	54	11	13	27	31
Has R visited other women with intent to tell them about contraceptive methods?								
Yes	†	†	†	66*	†	16*	39*	42
No	32	32	39	52	†	14	28	30
Do R's friends, neighbors envy a family with many children?								
Yes	31*	†	32*	58*	10*	5*	23	27
No	34	33	40	54	12	16	29	32

† Sample size 0–24. * Sample size 25–49.

Table 1D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of affective accessibility: Cheju and Hapchun (AFTER D)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of affective accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	47	55	16	15	37	32
R or husband is too old for another child								
Important	†	†	43	48	15	14	28	23
Not important	48	36	50	59	18	17	43	40
Is tubal ligation or IUD safe for a woman?								
Yes	72	46	58	58	23	20	50	39
No	39	17	42	41	14	5	31	16
Is induced abortion safe for a woman?								
Yes	67*	58*	58	61	25	20	46	42
No	46	27	45	53	14	14	36	30
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	46	41	52	55	21	17	41	37
Disagree	55*	19	37	55	9	13	28	26
Did R desire more children before becoming pregnant with last child?								
Yes	46	26	38	37	16	8	35	21
No	65*	76*	63	67	16	21	42	44
Friends, relatives, neighbors using contraceptives?								
Many	59	45*	48	64	24	21	44	44
None or few	42	29	46	48	13	12	33	26
Does R's husband know a lot about contraceptive methods?								
Yes	56	37	52	55	20	16	46	36
No	39	24	42	55	14	14	30	28
Does R's husband talk about contraception with her?								

Yes	50	37	52	55	21	17	45	37
No	41	17*	39	55	14	12	26	25
Has R advised young couples to have only adequate number of children?								
Yes	52	45	47	55	14	17	36	34
No	45	27	48	56	19	12	38	30
Has R recommended family planning to people with many children?								
Yes	56	51*	47	56	16	17	40	36
No	43	26	48	54	16	13	36	28
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	72	†	56	56	23*	20	53	40
No	42	30	45	55	15	14	33	31
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	46*	†	†	†	46	27
No	47	34	48	56	15	15	36	33
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	76	69*	58	63	24*	17	56	44
No	40	25	42	47	15	13	31	26
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	60*	60*	†	27*	61	44
No	45	32	46	55	16	14	35	31
Has R visited other women with intent to tell them about contraceptive methods?								
Yes	†	†	†	68*	14*	16*	43	43
No	47	33	47	53	16	15	37	31
Do R's friends, neighbors envy a family with many children?								
Yes	38*	†	35*	58*	12*	5*	27	28
No	50	34	49	54	17	16	39	33

† Sample size 0–24. * Sample size 25–49.

Table 1E. Use of contraceptives since September 1976 among ever married-women 15-49 years of age who had never used or had stopped using them before September 1976, by selected measures of affective accessibility: Cheju and Hapchun (AFTER E)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of affective accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	37	51	77	16	26	36	47
R or husband is too old for another child								
Important	†	†	53	75	14	25	30	39
Not important	36	41	50	47	20	27	39	53
Is tubal ligation or IUD safe for a woman?								
Yes	60	49	65	79	31	37	55	59
No	28	23	44	66	12	9	29	25
Is induced abortion safe for a woman?								
Yes	31*	64*	59	81	23*	35	40	60
No	38	32	49	76	15	24	36	44
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	37	46	56	80	21	35	40	57
Disagree	36*	21	40	71	11	18	28	34
Did R desire more children before becoming pregnant with last child?								
Yes	34	29	40	57	16	16	32	31
No	†	†	70	90	16	36	46	66
Friends, relatives, neighbors using contraceptives?								
Many	45	49*	58	83	23	38	46	61
None or few	32	33	45	73	14	20	30	40
Does R's husband know a lot about contraceptive methods?								
Yes	42	40	58	81	25	35	46	56
No	31	30	44	71	13	20	28	38
Does R's husband talk about contraception with her?								

Yes	41	41	59	80	26	35	46	56
No	25	21*	38	70	12	18	23	34
Has R advised young couples to have only adequate number of children?								
Yes	45	54	55	81	18	30	40	54
No	31	30	46	72	15	20	31	40
Has R recommended family planning to people with many children?								
Yes	48	57*	57	83	20	31	44	57
No	30	30	46	70	14	21	31	38
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	62*	†	67	90	†	51*	59	73
No	31	34	47	74	15	22	31	43
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	67*	†	†	†	60	57*
No	35	37	49	76	16	26	34	47
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	69	77*	72	91	†	39	65	71
No	28	28	42	64	14	21	28	35
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	66	†	†	†	68	76*
No	34	36	49	75	15	23	34	45
Has R visited other women with intent to tell them about contraceptive methods?								
Yes	†	†	†	97*	†	43*	†	71
No	36	37	50	74	16	24	35	45
Do R's friends, neighbors envy a family with many children?								
Yes	31*	†	39*	79*	14*	10*	27	38
No	38	39	53	77	17	28	38	48

† Sample size 0–24. * Sample size 25–49.

Table 1F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of affective accessibility: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of affective accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	27	48	48
R or husband is too old for another child								
Important	†	†	60	75	22	26	39	39
Not important	52	42	64	80	28	28	53	55
Is tubal ligation or IUD safe for a woman?								
Yes	77	52	80	81	41*	38	70	60
No	44	23	54	68	19	10	40	26
Is induced abortion safe for a woman?								
Yes	†	64*	76	82	43*	35	65	61
No	50	33	60	77	20	25	45	45
Most important thing about contraception is it makes sex worry-free, enjoyable								
Agree	51	48	69	81	32	36	53	58
Disagree	56*	21	49	74	13	19	36	36
Did R desire more children before becoming pregnant with last child?								
Yes	50	30	50	58	23	17	44	33
No	†	†	85	92	25	36	59	67
Friends, relatives, neighbors using contraceptives?								
Many	63	51*	68	84	41	38	61	62
None or few	47	34	58	74	18	22	41	41
Does R's husband know a lot about contraceptive methods?								
Yes	62	42	70	82	36	38	61	58
No	42	30*	54	74	19	20	38	39
Does R's husband talk about contraception with her?								

Yes	55	43	70	81	36	37	59	57
No	45	21*	48	73	19	18	34	35
Has R advised young couples to have only adequate number of children?								
Yes	60	56	65	81	24	31	51	55
No	47	31	59	75	24	21	45	42
Has R recommended family planning to people with many children?								
Yes	63	59*	68	84	29	32	57	58
No	46	31	58	72	22	22	43	40
Has R told others how to obtain, use contraceptive devices or pills?								
Yes	83*	†	82	90	†	51*	76	74
No	45	34	58	75	22	23	42	44
Has R instructed a woman about to be married about contraceptives?								
Yes	†	†	73*	†	†	†	71*	57*
No	51	39	62	78	23	27	46	48
Has R recommended a contraceptive method to a friend or neighbor?								
Yes	86	81*	83	91	†	41	80	73
No	43	28	53	66	21	21	39	36
Has R shown her contraceptive pills or devices to other women?								
Yes	†	†	86*	†	†	†	86	76*
No	49	38	60	77	23	24	45	46
Has R visited other women with intent to tell them about contraceptive methods?								
Yes	†	†	†	100*	†	45*	†	74
No	52	38	62	75	24	25	48	46
Do R's friends, neighbors envy a family with many children?								
Yes	38*	†	45*	79*	18*	10*	32	40
No	55	40	65	78	26	28	51	49

† Sample size 0–24. * Sample size 25–49.

Table 2A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER A)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	54	57
Place or person visited for family planning advice								
Health center	54	47	71	86	38	47	58	65
None or NA	59*	16*	57*	67*	23	23	43	34
Heard about pill (probing)?								
Yes	54	41	72	83	40	41	58	59
No	†	†	†	†	3*	†	26	29
Know how to use pill?								
Yes	61	46	78	83	50	53	66	65
No	36	22*	42	79*	13	17	29	34
Heard about condom (probing)?								
Yes	56	44	77	85	54	43	65	62
No	52	28*	54	72	22	30	40	43
Know how to use condom?								
Yes	68	50	83	86	68	51	74	68
No	43	30	58	78	24	31	42	47
Heard about vasectomy (probing)?								
Yes	56	42	70	83	44	45	60	61
No	52	†	66	†	21	8*	45	31
Know how to use vasectomy?								
Yes	66	47	72	84	56*	54	67	66
No	47	30	67	80	25	26	48	46
Heard about tubal ligation (probing)?								
Yes	57	40	70	83	42	42	59	59
No	49	†	64	†	15	12*	43	26*

Know how to use tubal ligation?								
Yes	66	48	73	86	57*	54	68	67
No	47	19*	64	64*	22	12	45	27
Heard about IUD (probing)?								
Yes	55	42	73	83	42	41	60	59
No	50*	†	50*	†	8*	†	33	24*
Know how to use IUD?								
Yes	67	50	84	85	66	55	74	68
No	39	20	50	71*	11	12	34	30
Heard about jelly, injection, sponge (probing)?								
Yes	58	42	74	82	47	48	63	62
No	42	†	48	†	13	13	13	32
Know how to use jelly, injection, sponge?								
Yes	69*	56*	77	87*	†	†	72	71
No	51	35	66	82	29	36	50	54
Heard about induced abortion (probing)?								
Yes	57	41	72	85	39	42	60	60
No	43*	33*	54*	63*	19	24*	37	38
Know how to use induced abortion?								
Yes	72	51	76	87	57	55	71	70
No	30	26	56	70	15	20	33	36
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	61	43	79	85	53	64	67	69
No	51	37	63	81	26	31	48	50
Know how to use rhythm, abstinence, withdrawal?								
Yes	62	45	80	86	62*	70*	70	72
No	51	37	64	80	26	30	49	50

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 2B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER B)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	38	38	56	81	21	37	41	55
Place or person visited for family planning advice								
Health center	37	47	59	84	23	44	43	63
None or NA	43*	13*	44*	65*	17	23	32	33
Heard about pill (probing)?								
Yes	39	40	59	81	26	40	44	57
No	†	†	31*	†	3*	†	18	29*
Know how to use pill?								
Yes	44	45	62	82	32	50	50	64
No	21	20*	38	74*	9	17	22	32
Heard about condom (probing)?								
Yes	41	42	62	84	33	41	49	60
No	32	28*	45	69	16	28	29	42
Know how to use condom?								
Yes	49	49	68	86	45*	49	57	67
No	29	28	47	75	16	30	31	45
Heard about vasectomy (probing)?								
Yes	41	40	58	82	25	43	45	60
No	32	26*	51	†	17	8*	32	29
Know how to use vasectomy?								
Yes	52	46	62	84	32	53	53	66
No	29	29	52	76	18	25	34	44
Heard about tubal ligation (probing)?								
Yes	40	39	57	82	27	40	44	58
No	34	†	52	†	11	12*	32	26*

Know how to use tubal ligation?								
Yes	48	46	61	85	36*	52	52	66
No	32	19*	51	62*	16	11	33	26
Heard about IUD (probing)?								
Yes	39	40	59	82	28	40	44	58
No	35*	†	44	†	6	†	27	24*
Know how to use IUD?								
Yes	48	48	69	85	43	54	56	67
No	26	20	41	65	8	12	25	28
Heard about jelly, injection, sponge (probing)?								
Yes	43	41	60	81	29	45	48	60
No	22	†	38	†	11	13	22	31
Know how to use jelly, injection, sponge?								
Yes	56*	56*	68	87*	†	†	61	71
No	34	33	52	80	19	35	36	52
Heard about induced abortion (probing)?								
Yes	38	40	57	83	24	40	42	59
No	40*	30*	52*	63	16	24*	34	37
Know how to use induced abortion?								
Yes	45	48	58	85	31	52	48	67
No	28	26	52	70	13	20	31	36
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	47	42	68	85	29*	64*	54	68
No	33	36	49	78	19	29	34	48
Know how to use rhythm, abstinence, withdrawal?								
Yes	50	43	69	86	38*	70*	56	71
No	33	36	51	78	18	29	35	48

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 2C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER C)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	28	32
Place or person visited for family planning advice								
Health center	32	39	42	57	12	15	30	35
None or NA	39*	10*	30	44	11	12	23	20
Heard about pill (probing)?								
Yes	33	33	41	54	13	15	30	32
No	†	†	24*	†	2*	†	16	22*
Know how to use pill?								
Yes	38	38	43	56	15	16	33	35
No	18	14*	29	47	6	10	16	20
Heard about condom (probing)?								
Yes	34	34	44	56	14	14	34	33
No	30	26*	32	49	10	15	21	27
Know how to use condom?								
Yes	41	39	46	57	16	15	38	36
No	25	25	34	52	10	14	22	28
Heard about vasectomy (probing)?								
Yes	35	33	42	55	13	16	32	33
No	28	†	34	45*	10	5	22	20
Know how to use vasectomy?								
Yes	44	39	44	58	16	18	37	37
No	26	23	37	50	10	11	24	26
Heard about tubal ligation (probing)?								
Yes	34	32	41	55	14	15	31	32
No	31	†	36	†	7	9*	23	19

Know how to use tubal ligation?								
Yes	41	38	42	58	17	19	35	38
No	27	14*	37	37	9	5	23	14
Heard about IUD (probing)?								
Yes	34	33	41	55	15	15	31	33
No	25*	†	33	†	1	9*	18	17
Know how to use IUD?								
Yes	42	42	47	57	19	17	37	36
No	21	14	30	44	4	8	18	19
Heard about jelly, injection, sponge (probing)?								
Yes	38	34	42	55	14	16	33	34
No	16	†	29	49*	7	7	16	19
Know how to use jelly, injection, sponge?								
Yes	47*	46*	47	48	15*	15*	40	37
No	30	28	37	56	11	14	26	31
Heard about induced abortion (probing)?								
Yes	32	33	40	56	12	14	29	33
No	39*	26*	38	43*	10	14	26	25
Know how to use induced abortion?								
Yes	37	39	40	58	15	16	32	36
No	27	23	38	45	8	11	23	23
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	37	30	44	53	10	13	33	33
No	31	34	37	56	12	15	26	31
Know how to use rhythm, abstinence, withdrawal?								
Yes	38	30	42	53	12	15	34	34
No	31	33	39	55	12	14	27	31

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 2D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER D)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	47	55	16	15	37	32
Place or person visited for family planning advice								
Health center	46	40	49	58	18	16	39	36
None or NA	54*	12*	38	44	14	12	30	20
Heard about pill (probing)?								
Yes	47	34	49	55	19	16	39	33
No	†	†	28*	†	2*	†	22	22*
Know how to use pill?								
Yes	53	39	53	56	21	17	44	36
No	32	16*	30	50	8	10	21	22
Heard about condom (probing)?								
Yes	48	36	54	56	23	14	45	34
No	48	26*	37	51	12	16	27	28
Know how to use condom?								
Yes	58	40	56	57	24	15	49	36
No	38	26	41	54	14	14	29	29
Heard about vasectomy (probing)?								
Yes	49	34	50	56	21	16	42	34
No	46	†	43	52*	12	5	30	22
Know how to use vasectomy?								
Yes	56	40	50	58	26	18	46	37
No	43	24	46	52	13	11	33	27
Heard about tubal ligation (probing)?								
Yes	49	33	49	56	21	15	40	33
No	44	†	44	†	8	9*	29	19

Know how to use tubal ligation?								
Yes	57	40	49	59	26	20	46	39
No	41	14*	45	38	12	5	31	14
Heard about IUD (probing)?								
Yes	49	35	50	56	21	15	41	33
No	39*	†	36	†	3	9*	22	17
Know how to use IUD?								
Yes	58	44	56	57	27	18	48	37
No	34	14	36	49	6	8	24	20
Heard about jelly, injection, sponge (probing)?								
Yes	52	35	50	56	20	17	42	35
No	35	†	36	51*	8	7	23	20
Know how to use jelly, injection, sponge?								
Yes	57*	46*	52	48	18*	15*	46	37
No	46	29	46	57	16	15	35	32
Heard about induced abortion (probing)?								
Yes	49	34	49	57	18	15	40	33
No	42*	29*	39	43*	13	14	28	26
Know how to use induced abortion?								
Yes	60	41	51	59	23	17	45	37
No	29	23	40	45	9	11	25	23
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	50	31	50	53	22	13	43	33
No	47	35	46	57	15	16	34	32
Know how to use rhythm, abstinence, withdrawal?								
Yes	50	31	48	53	23	15	43	34
No	47	34	47	56	15	15	35	32

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 2E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER E)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	37	51	77	16	26	36	47
Place or person visited for family planning advice								
Health center	36	46	54	81	18	30	39	54
None or NA	41	12*	38	60	14	17	28	28
Heard about pill (probing)?								
Yes	37	39	53	77	19	27	38	48
No	†	†	31*	†	3*	†	18	28*
Know how to use pill?								
Yes	42	44	55	78	22	32	43	53
No	21	20*	38	74*	9	14	21	29
Heard about condom (probing)?								
Yes	39	41	57	80	23	27	44	51
No	31	27*	41	67	13	22	26	36
Know how to use condom?								
Yes	46	47	61	81	28	31	50	56
No	28	28	43	72	13	22	28	39
Heard about vasectomy (probing)?								
Yes	40	39	53	78	19	30	40	51
No	30	†	46	†	14	6	28	25
Know how to use vasectomy?								
Yes	50	45	57	80	23	35	47	56
No	28	28	48	72	14	18	30	37
Heard about tubal ligation (probing)?								
Yes	38	38	52	78	21	27	39	49
No	33	†	48	†	9	11*	29	24*

Know how to use tubal ligation?								
Yes	45	44	55	80	26	35	46	56
No	31	19*	47	60*	13	8	29	22
Heard about IUD (probing)?								
Yes	37	39	54	77	20	27	39	49
No	33*	†	41	†	5	11*	25	22
Know how to use IUD?								
Yes	46	47	61	80	29	33	48	56
No	25	20	38	63*	7	10	23	26
Heard about jelly, injection, sponge (probing)?								
Yes	42	40	54	77	21	30	42	51
No	20	†	38	76*	10	11	20	28
Know how to use jelly, injection, sponge?								
Yes	53*	54*	64	85*	†	33*	54	61
No	33	32	47	75	15	25	32	44
Heard about induced abortion (probing)?								
Yes	36	39	52	79	18	27	38	49
No	40*	30*	49	61*	13	20*	31	34
Know how to use induced abortion?								
Yes	43	47	52	80	22	32	42	55
No	28	25	48	68	11	16	28	32
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	45	40	62	80	22*	37	48	57
No	32	36	45	73	15	22	31	41
Know how to use rhythm, abstinence, withdrawal?								
Yes	47	41	62	81	29*	39	50	59
No	32	35	46	74	14	21	31	41

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 2F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of cognitive accessibility: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of cognitive accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	27	48	48
Place or person visited for family planning advice								
Health center	52	47	65	82	28	31	52	56
None or NA	56*	15*	50	61*	18	17	37	28
Heard about pill (probing)?								
Yes	52	40	65	79	29	28	51	50
No	†	†	†	†	3*	†	26	28*
Know how to use pill?								
Yes	58	44	69	78	33	33	57	54
No	35	22*	42	79*	12	14	28	31
Heard about condom (probing)?								
Yes	54	43	70	81	37	28	58	52
No	50	27*	50	70	17	23	35	38
Know how to use condom?								
Yes	64	49	74	81	42	32	65	57
No	42	29	54	75	19	23	38	41
Heard about vasectomy (probing)?								
Yes	54	41	64	78	31	31	53	52
No	48	†	59	†	17	6	39	27
Know how to use vasectomy?								
Yes	63	46	66	80	39	36	60	57
No	46	30	60	76	20	19	42	39
Heard about tubal ligation (probing)?								
Yes	54	39	64	79	32	28	52	50
No	48	†	58	†	12	11*	38	24*

Know how to use tubal ligation?								
Yes	62	46	66	81	40	36	60	57
No	46	19*	59	63*	18	9	40	23
Heard about IUD (probing)?								
Yes	53	41	66	79	30	28	52	50
No	48*	†	46	†	7	11*	31	22
Know how to use IUD?								
Yes	63	49	75	80	42	34	63	56
No	39	20	47	69*	10	11	32	28
Heard about jelly, injection, sponge (probing)?								
Yes	56	41	66	78	32	31	55	52
No	40	†	47	80*	11	11	30	29
Know how to use jelly, injection, sponge?								
Yes	65*	54*	73	85*	†	33*	64	61
No	49	34	59	77	23	26	44	46
Heard about induced abortion (probing)?								
Yes	54	40	65	80	28	28	52	51
No	43*	33*	51	61*	16	20*	34	35
Know how to use induced abortion?								
Yes	67	49	68	82	38	34	61	57
No	30	25	52	68	12	16	31	32
Heard about rhythm, abstinence, withdrawal (probing)?								
Yes	58	41	71	80	39*	37	60	58
No	49	37	58	77	20	23	42	43
Know how to use rhythm, abstinence, withdrawal?								
Yes	58	43	72	81	46*	39	62	60
No	50	36	59	77	20	22	43	43

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 3A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15-49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER A)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Measure of economic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	55	57
Costs reasonable?								
No or NA	27	22	47	60	16	13	29	29
Yes	80	54	80	90	65*	56	78	72
Costs of tubal ligation and IUD								
Not free or NA	46	14*	58	50*	15	7	42	19
Free	77	47	82	86	65	49	77	65
Costs of tubal ligation and IUD reasonable?								
No or NA	38	14	51	64*	11	8	35	24
Yes	82	53	83	86	66	52	79	68
Cost of abortion								
More than 10,000 won or NA	49	39	61	76	25	28	47	48
10,000 won or less	90*	†	86	95	68*	76	84	85
Cost of abortion reasonable?								
No or NA	48	33	63	79	26	31	48	50
Yes	84*	67*	84	90	65*	58	81	74

† Sample size 0-24.

* Sample size 25-29.

NA—Not applicable.

Table 3B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER B)

Measure of economic accessibility	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	38	38	56	81	21	37	41	55
Costs reasonable?								
No or NA	13	21	38	58	10	13	19	28
Yes	60	52	65	88	45	53	60	70
Costs of tubal ligation and IUD								
Not free or NA	32	14*	45	48*	10	7	30	18
Free	54	45	70	84	43	47	59	64
Costs of tubal ligation and IUD reasonable?								
No or NA	26	14	36	62*	8	8	24	23
Yes	58	51	72	84	42	50	61	66
Cost of abortion								
More than 10,000 won or NA	37	38	52	76	18	27	37	48
10,000 won or less	50*	50*	65	92	32*	71*	54	82
Cost of abortion reasonable?								
No or NA	34	32	54	79	18	30	37	50
Yes	58*	63*	61	86	34*	53	54	70

* Sample size 25–49.

NA—Not applicable.

Table 3C. Use of program contraceptives since September 1976 among ever-married women 15-49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER C)

Measure of economic accessibility	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	28	32
Costs reasonable?								
No or NA	8	20	27	41	6	5	13	19
Yes	53	41	45	58	17	18	39	37
Costs of tubal ligation and IUD								
Not free or NA	28	10*	33	29*	6	4	23	12
Free	46	39	47	57	20	16	37	35
Costs of tubal ligation and IUD reasonable?								
No or NA	23	9	27	36	5	3	18	13
Yes	50	44	49	57	19	18	39	37
Cost of abortion[a]								
More than 10,000 won or NA	31	31	37	50	11	10	26	28
10,000 won or less	45*	†	46	63	15	27	36	45
Cost of abortion reasonable?								
No or NA	29	27	38	53	11	11	26	28
Yes	51*	55*	42	58	16	24	36	42

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

a. Correlation in Cheju below 0.15.

Table 3D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER D)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of economic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	47	55	16	15	37	32
Costs reasonable?								
No or NA	22	21	33	42	11	5	20	20
Yes	70	42	54	59	22	19	49	37
Costs of tubal ligation and IUD								
Not free or NA	40	10*	40	29*	8	4	30	12
Free	67	40	55	58	27	17	48	36
Costs of tubal ligation and IUD reasonable?								
No or NA	34	9	36	36	6	3	26	13
Yes	71	45	56	58	27	18	50	38
Cost of abortion								
More than 10,000 won or NA	42	32	43	51	14	10	33	28
10,000 won or less	82*	42*	57	65	25	29	51	46
Cost of abortion reasonable?								
No or NA	41	27	43	53	14	11	33	28
Yes	76*	58*	59	60	24	26	52	44

* Sample size 25–49.

NA—Not applicable.

Table 3E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER E)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of economic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	37	51	77	16	26	36	47
Costs reasonable?								
No or NA	13	20	37	58	9	11	18	26
Yes	57	51	58	83	28	33	51	57
Costs of tubal ligation and IUD								
Not free or NA	31	13	41	43*	9	6	28	16
Free	52	45	65	81	27	31	50	54
Costs of tubal ligation and IUD reasonable?								
No or NA	26	13	33	58*	7	6	22	20
Yes	56	50	66	80	27	34	52	56
Cost of abortion								
More than 10,000 won or NA	35	37	49	72	14	20	33	41
10,000 won or less	47*	†	56	87	23*	45	45	66
Cost of abortion reasonable?								
No or NA	32	32	50	75	14	21	33	43
Yes	56*	61*	53	80	25*	37	47	59

† Sample size 0–24.

* Sample size 25-49.

NA—Not applicable.

Table 3F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of perceived economic accessibility: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of economic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	27	48	48
Costs reasonable?								
No or NA	27	22	45	60	14	11	27	27
Yes	74	52	71	84	38	35	65	58
Costs of tubal ligation and IUD								
Not free or NA	44	13*	52	44*	13	6	38	16
Free	74	47	76	82	40	32	64	55
Costs of tubal ligation and IUD reasonable?								
No or NA	37	13	46	60*	10	6	32	20
Yes	79	52	76	82	41	35	67	58
Cost of abortion								
More than 10,000 won or NA	48	38	57	72	19	20	42	42
10,000 won or less	84*	†	74	91	45*	48	69	69
Cost of abortion reasonable?								
No or NA	50	32	59	76	20	21	43	43
Yes	80*	64*	73	84	44*	40	69	62

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 4A. Use of contraceptives and induced abortion since september 1976 among ever-married women 15-49 years of age who had never used them before, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER A)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Measure of geographic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	55	57
Know where to get contraceptive supplies?								
Yes	†	†	38*	†	9	2*	18	11
No	59	43	73	84	44	48	62	63
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	58	43	73	84	40	48	61	63
Other location or don't know	50	34	59	78*	21	12	45	40
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	16*	29*	46	71	19	22	28	42
Less than 30 minutes	60	43	75	87	44	50	63	64
Means of transportation?								
Walk	57	22	64	76	21	24	49	44
Other or NA	53	50	73	88	48	59	60	69
Convenient to get contraceptives?								
No	34	30*	49	68	14	20	31	38
Yes	62	45	75	87	52	50	66	66

Know where to get IUD or tubal ligation?								
No	28*	†	38*	†	8	†	22	3
Yes	61	43	76	84	49	47	65	62
Time it takes to get tubal ligation or IUD								
30 minutes, longer, or NA	39	33	46	76	17	31	34	49
Less than 30 minutes	62	43	81	87	49	45	68	62
Convenience of place for tubal ligation and IUD?								
Inconvenient	38	29*	44	76*	8	18	29	39
Convenient	60	43	78	84	51	47	66	62
Convenience of place for abortion?								
Inconvenient	37	32	48	79	20	20	35	45
Convenient	61	44	79	84	43	46	65	62

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 4B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER B)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of geographic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	38	38	56	81	21	37	41	55
Know where to get contraceptive supplies?								
Yes	†	†	38*	†	5	2*	15	10
No	41	42	58	83	29	46	46	61
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	42	42	60	83	29	46	47	62
Other location or don't know	33	32	46	74*	12	12	31	38
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	12*	29*	42	70	8	20	20	40
Less than 30 minutes	42	41	60	86	32	48	47	62
Means of transportation?								
Walk	37	22	48	76	12	24	33	44
Other or NA	40	48	62	85	34	55	48	66
Convenient to get contraceptives?								
No	24	30*	40	66	9	18	22	35
Yes	44	43	61	86	35	50	50	65

Know where to get IUD or tubal ligation?								
No	14*	†	26	†	7	†	14	3
Yes	44	42	63	82	31	45	50	61
Time it takes to get tubal ligation or IUD?								
30 minutes, longer, or NA	25	31	34	75	12	30	23	48
Less than 30 minutes	44	42	68	85	32	43	52	60
Convenience of place for tubal ligation and IUD?								
Inconvenient	21	29*	33	72*	6	16	19	37
Convenient	44	42	65	83	34	46	51	61
Convenience of place for abortion?								
Inconvenient	30	32	43	78	17	20	30	44
Convenient	41	42	62	82	24	44	46	60

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 4C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER C)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of geographic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	28	32
Know where to get contraceptive supplies?								
Yes	†	†	30*	†	5	2	12	7
No	35	34	41	56	14	16	31	34
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	36	35	41	55	14	16	31	33
Other location or don't know	29	26	35	52	8	8	24	26
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	11*	37*	34	47	7	9	17	24
Less than 30 minutes	36	34	41	57	14	17	32	35
Means of transportation?								
Walk	34	20	36	53	8	12	25	27
Other or NA	33	39	42	56	16	17	32	36
Convenient to get contraceptives?								
No	18	26*	28	42	6	9	16	22
Yes	38	35	43	58	15	17	34	35

Know where to get IUD or tubal ligation?								
No	11*	†	20	†	5	†	11	1
Yes	38	35	44	55	15	16	34	34
Time it takes to get tubal ligation or IUD?								
30 minutes, longer, or NA	23	23	25	52	8	12	17	27
Less than 30 minutes	38	37	47	56	15	16	35	34
Convenience of place for tubal ligation and IUD?								
Inconvenient	16	23*	27	52	4	7	14	23
Convenient	39	35	44	54	17	17	34	34
Convenience of place for abortion?								
Inconvenient	24	27	32	55	10	8	21	27
Convenient	37	35	43	54	13	17	32	34

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 4D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER D)

Measure of geographic accessibility	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	48	55	16	15	37	32
Know where to get contraceptive supplies?								
Yes	†	†	30*	29*	8	2	15	9
No	51	36	49	56	19	16	41	35
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	50	36	49	55	18	16	39	34
Other location or don't know	46	28	43	56	13	8	34	27
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	†	37*	37	48	15	10	22	25
Less than 30 minutes	52	35	50	58	17	17	41	36
Means of transportation?								
Walk	53	20	47	53	13	12	36	27
Other or NA	44	41	48	57	20	18	38	37
Convenient to get contraceptives?								
No	28	26*	35	43	10	11	22	24
Yes	55	37	51	59	20	17	43	36

Know where to get IUD or tubal ligation?								
No	24*	†	29	†	5	†	17	1
Yes	54	36	52	56	22	16	43	35
Time it takes to get tubal ligation or IUD?								
30 minutes, longer, or NA	35	25	33	52	11	12	24	28
Less than 30 minutes	54	38	55	58	21	17	45	35
Convenience of place for tubal ligation and IUD?								
Inconvenient	32	23*	34	54	5	8	21	24
Convenient	53	37	52	55	24	17	44	35
Convenience of place for abortion?								
Inconvenient	30	27	34	55	12	8	24	27
Convenient	55	36	54	56	20	18	44	34

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 4E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER E)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of geographic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	37	51	77	16	26	36	47
Know where to get contraceptive supplies?								
Yes	†	†	38*	†	5	2*	14	10
No	39	40	53	79	21	30	40	51
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	41	41	54	78	20	30	40	51
Other location or don't know	32	31	45	71	10	10	29	34
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	12*	28*	41	65	8	16	20	35
Less than 30 minutes	40	41	54	82	22	31	41	52
Means of transportation?								
Walk	35	22	45	74	10	18	30	38
Other or NA	38	46	56	80	25	36	42	56
Convenient to get contraceptives?								
No	23	30*	39	61	8	14	21	31
Yes	42	42	55	82	23	32	43	54

Know where to get IUD or tubal ligation?								
No	13*	†	24	†	7	†	14	3
Yes	43	41	58	78	22	30	43	51
Time it takes to get tubal ligation or IUD?								
30 minutes, longer, or NA	25	29	31	70	10	22	22	41
Less than 30 minutes	42	42	62	82	22	29	45	51
Convenience of place for tubal ligation and IUD?								
Inconvenient	19	28*	30	68	6	12	18	31
Convenient	43	41	59	79	24	32	44	53
Convenience of place for abortion?								
Inconvenient	28	31	40	71	15	14	27	37
Convenient	40	41	56	79	18	31	41	52

† Sample size 0–24.

* Sample size 25–49.

NA—Not applicable.

Table 4F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of geographic accessibility: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of geographic accessibility	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	27	48	48
Know where to get contraceptive supplies?								
Yes	†	†	38*	†	9	2*	18	11
No	56	42	66	80	30	31	54	53
Place where to get contraceptive supplies?								
Health center, village depot, or hospital	56	42	65	79	28	32	52	52
Other location or don't know	48	33	57	74	18	10	42	36
Time it takes to get contraceptive supplies?								
30 minutes, longer, or NA	16*	28*	45	67	18	17	27	36
Less than 30 minutes	57	42	67	83	28	32	54	54
Means of transportation?								
Walk	55	22	59	75	17	18	44	38
Other or NA	51	48	66	82	34	38	53	58
Convenient to get contraceptives?								
No	33	30*	48	64	13	16	29	33
Yes	59	43	67	83	33	32	57	55

Know where to get IUD or tubal ligation?								
No	27*	†	35	†	7	†	21	3
Yes	59	42	69	80	33	31	57	53
Time it takes to get tubal ligation or IUD?								
30 minutes, longer, or NA	38	31	43	71	16	23	31	42
Less than 30 minutes	59	43	73	84	32	30	58	53
Convenience of place for tubal ligation and IUD?								
Inconvenient	36	28*	40	71	8	13	27	32
Convenient	58	43	71	80	34	33	57	54
Convenience of place for abortion?								
Inconvenient	34	31	44	72	17	14	†	37
Convenient	60	43	72	80	30	32	†	53

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5A. Use of contraceptives and induced abortion since September 1979 among ever-married women 15-49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER A)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Measure of program quality	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	55	57
Program people helpful?								
No or NA	28	19*	46	53*	12	13	27	25
Yes	65	50	76	89	53	53	68	69
Program available at satisfactory hours?								
No or NA	28	22	48	59	15	20	29	32
Yes	66	50	77	90	56	53	69	70
Ever visited place or someone about contraceptive method?								
No	49	34	61	78	27	33	47	51
Yes	88*	†	96	100*	†	†	92	96
Ever visited by canvasser or family planning worker?								
No	50	35	55	73	26	14	45	38
Yes	67	44	84	86	42	56	69	68
Canvasser or family planning worker helpful?								
No or NA	51	29	60	71	24	17	48	36
Yes	81	57	90	89	64	71	82	78

Ever talked with canvasser or family planning worker outside home?								
No	52	32	66	79	27	29	50	49
Yes	68*	55*	76	87	56	52	70	69
Is source physician?								
No	51	34	59	80	25	34	47	52
Yes	69*	†	94	95*	†	†	82	83
Is source family planning worker from health center?								
No	50	24	60	70*	25	13	47	31
Yes	65	48	82	86	48*	52	69	67
Is source other public health worker?								
No	50	36	63	76	25	23	48	44
Yes	68	45	81	86	56*	54	72	68
Is source husband?								
No	49	37	59	83	27	30	44	50
Yes	58	42	78	82	50*	53	66	64

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5B. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER B)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of program quality	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	38	39	56	81	21	37	41	55
Program people helpful?								
No or NA	21	19*	41	51*	8	13	21	25
Yes	45	48	60	87	35	50	50	67
Program available at satisfactory hours?								
No or NA	21	22	44	56	9	19	23	31
Yes	46	48	60	89	38	51	51	69
Ever visited place or someone about contraceptive method?								
No	33	34	49	78	18	32	34	50
Yes	68*	†	82	94*	†	†	74	89
Ever visited by canvasser or family planning worker?								
No	33	35	45	69	17	14	32	37
Yes	52	42	68	85	29	54	54	66
Canvasser or family-planning worker helpful?								
No or NA	34	29	48	68	16	16	34	35
Yes	69*	53	76	88	43*	69	67	76

Ever talked with canvasser or family planning worker outside home?								
No	37	31	51	78	19	28	37	48
Yes	45*	53*	68	85	29*	50	53	66
Is source physician?								
No	37	34	50	78	19	33	37	51
Yes	43*	†	71	93*	31*	†	54	80
Is source family planning worker from health center?								
No	37	24	49	66*	19	13	36	30
Yes	42	46	66	84	26	49	50	65
Is source other public health worker?								
No	35	34	52	74	16	21	36	42
Yes	48	43	64	85	37*	54	53	67
Is source husband?								
No	29	37	46	82	19	29	31	49
Yes	45	40	65	81	29*	50	52	62

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER C)

Measure of program quality	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	29	32
Program people helpful?								
No or NA	14	16	30	33	5	6	15	15
Yes	40	40	42	59	16	17	34	37
Program available at satisfactory hours?								
No or NA	15	21	33	34	6	9	16	19
Yes	41	39	42	61	17	17	34	37
Ever visited place or someone about contraceptive method?								
No	28	28	36	51	11	13	25	28
Yes	61*	†	52	68	18*	25	45	52
Ever visited by canvasser or family planning worker?								
No	28	38	33	47	9	7	24	23
Yes	45	35	47	57	15	18	36	36
Canvasser or family planning worker helpful?								
No or NA	30	23	36	42	9	8	25	20
Yes	53*	45	48	61	19	23	40	43

Ever talked with canvasser or family planning worker outside home?								
No	32	27	36	54	10	12	26	29
Yes	39*	42	48	55	17	17	38	35
Is source physician?								
No	33	28	36	54	11	13	26	30
Yes	35	†	48	56	15	23	35	43
Is source family planning worker from health center?								
No	32	21	34	45	10	6	25	19
Yes	36	37	48	56	14	18	35	36
Is source other public health worker?								
No	31	28	37	50	9	9	26	25
Yes	38	38	46	57	21	19	36	37
Is source husband?								
No	26	32	32	57	11	13	22	29
Yes	38	32	48	53	12	16	37	34

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected measures of program quality: Cheju and Hapchun (AFTER D)

Measure of program quality	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	47	55	16	15	37	32
Program people helpful?								
No or NA	20	16	35	34	8	6	19	16
Yes	58	41	51	60	21	18	44	37
Program available at satisfactory hours?								
No or NA	22	21	35	36	10	10	21	20
Yes	58	41	52	62	22	17	45	38
Ever visited place or someone about contraceptive method?								
No	43	29	43	51	15	13	33	29
Yes	78*	†	61	73	26*	25	56	55
Ever visited by canvasser or family planning worker?								
No	43	28	38	49	14	7	32	24
Yes	58	37	58	57	21	19	45	37
Canvasser or family planning worker helpful?								
No or NA	46	23	43	44	13	8	34	21
Yes	62*	48	56	62	27	24	48	24

Ever talked with canvasser or family planning worker outside home?								
No	45	28	45	54	14	13	34	30
Yes	59*	44	54	57	28	18	48	36
Is source physician?								
No	45	28	42	55	14	14	33	30
Yes	57	†	61	58	26	23	50	45
Is source family planning worker from health center?								
No	44	21	40	47	13	6	32	20
Yes	56	39	59	57	23	18	47	37
Is source other public health worker?								
No	45	29	44	50	13	10	33	26
Yes	55	39	55	58	28	19	47	38
Is source husband?								
No	44	32	39	57	15	13	30	29
Yes	50	34	56	54	19	17	47	35

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5E. Use of contraceptives since September 1976 among ever-married women 15-49 years of age who had never used or had stopped using them before September 1976, by selected measures of program quality: Cheju and Hapchun (AFTER E)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of program quality	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	38	51	77	16	26	36	47
Program people helpful?								
No or NA	21	18*	39	51*	7	11	20	23
Yes	43	46	54	82	23	32	43	56
Program available at satisfactory hours?								
No or NA	21	22	42	56	8	15	22	27
Yes	44	46	54	84	25	33	44	57
Ever visited place or someone about contraceptive method?								
No	32	33	45	74	14	23	31	43
Yes	66*	†	74	92	†	47*	63	76
Ever visited by canvasser or family planning worker?								
No	31	35	41	66	14	11	29	33
Yes	50	40	62	81	20	35	46	55
Canvasser or family planning worker helpful								
No or NA	33	38	44	64	13	12	31	30
Yes	67*	52	69	85	28*	46	56	66

Ever talked with canvasser or family planning worker outside home?								
No	35	30	46	72	15	19	33	40
Yes	45*	53*	63	84	23*	36	49	58
Is source physician?								
No	36	33	45	74	15	23	33	43
Yes	40	†	66	89*	22*	46*	48	69
Is source family planning worker from health center?								
No	35	24	44	62*	15	10	32	26
Yes	41	45	62	81	19	33	44	55
Is source other public health worker?								
No	34	33	48	69	13	15	32	35
Yes	46	43	59	82	27	36	46	57
Is source husband?								
No	28	36	40	76	15	20	27	40
Yes	43	38	62	78	22*	36	48	55

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 5F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected measures of program quality: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Measure of program quality	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	27	48	48
Program people helpful?								
No or NA	27	18*	44	53*	12	11	26	23
Yes	62	48	68	84	34	34	58	57
Program available at satisfactory hours?								
No or NA	28	22	45	58	14	16	28	28
Yes	63	48	69	85	35	34	59	58
Ever visited place or someone about contraceptive?								
No	47	34	56	74	21	24	42	43
Yes	85*	†	87	98	†	†	79	81
Ever visited by canvasser or family planning worker?								
No	48	35	50	70	21	11	41	34
Yes	65	42	76	82	29	36	60	56
Canvasser or family planning worker helpful?								
No or NA	49	28	55	66	20	12	†	31
Yes	78*	56	82	86	40*	48	†	67

Ever talked with canvasser or family planning worker outside home?								
No	49	31	59	73	20	20	44	41
Yes	68*	55*	71	86	43*	38	64	60
Is source physician?								
No	49	34	54	76	20	24	42	44
Yes	65*	†	88	91*	47*	46*	71	71
Is source family planning worker from health center?								
No	48	24	54	65*	20	10	42	27
Yes	63	47	76	82	34	34	61	56
Is source other public health worker?								
No	48	34	58	71	19	17	43	37
Yes	66	44	74	83	40*	36	63	58
Is source husband?								
No	47	36	52	78	21	20	38	41
Yes	56	40	74	79	37*	37	61	56

† Sample size 0-24.

* Sample size 25-49.

NA—Not applicable.

Table 6A. Use of contraceptives and induced abortion since September 1976 among ever-married women 15-49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER A)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Socioeconomic measure	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	55	40	69	82	32	38	54	57
Any in-laws still living?								
No	†	†	63	88	24	33	42	55
Yes	56	39	70	80	40	43	59	58
Either parent still living?								
No	†	†	67*	80*	26	33	45	48
Yes	54	38	69	83	36	43	54	60
Interested in finding work?								
No	54	36	63	81	27	37	50	53
Yes	56	53*	74	86	39	42	58	65
Education								
None	†	†	†	83*	28*	31	36	46
Primary school	60	41*	67	80*	34	52	56	63
Middle school	53	38*	77	†	†	†	61	61
High school	49	†	73*	†	†	†	56	70*
College or more	†	†	†	†	†	†	57	†
Residential background								
City	52	NA	68	NA	35	NA	55	NA
Town	57	60*	72	95	30*	39*	56	70
Countryside	58*	34	66	79	29	38	52	54

† Sample size 0-24. * Sample size 25-49. NA—Not applicable.

Table 6B. Use of contraceptives since September 1976 among ever-married women 15-49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER B)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Socioeconomic measure	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	38	38	56	81	21	36	41	55
Any in-laws still living?								
No	†	†	52	88	14	32	30	54
Yes	39	37	57	78	28	41	44	56
Either parent still living?								
No	†	†	57*	80*	18	33	34	46
Yes	39	37	56	81	23	41	43	58
Interested in finding work?								
No	40	35	53	80	17	35	39	52
Yes	37	50*	59	84	25	42	42	63
Education								
None	†	†	†	83	23*	29	30	45
Primary school	37	41	53*	78	20	51	39	61
Middle school	37	†	63*	†	†	†	47	59
High school	36	†	66	†	†	†	45	67*
College or more	†	†	†	†	†	†	†	†
Residential background								
City	38	NA	61	NA	27	NA	45	†
Town	39	60*	55	95	17	39*	39	52
Countryside	38*	32	49	77	18	36	36	55

† Sample size 0-24. * Sample size 25-49. NA—Not applicable.

Table 6C. Use of program contraceptives since September 1976 among ever-married women 15–49 years of age who had never used them before, by selected socioeconomic measures: Cheju and Hapchun (AFTER C)

Socioeconomic measure	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	33	32	40	54	12	14	28	32
Any in-laws still living?								
No	24*	†	34	60	9	11	19	26
Yes	34	31	41	52	14	19	32	35
Either parent still living?								
No	†	†	32	45	10	14	19	23
Yes	33	31	42	56	13	14	31	36
Interested in finding work?								
No	36	29	39	55	10	14	28	30
Yes	31	42*	40	53	13	16	29	35
Education								
None	†	†	†	58	12	12	18	23
Primary school	33	36	38	51	12	20	27	37
Middle school	32	30*	51	69*	7*	†	35	38
High school	31	†	45	†	†	†	35	37*
College or more	†	†	†	†	†	†	†	†
Residential background								
City	32	NA	44	NA	14	NA	31	NA
Town	34	49*	40	67	10	15	28	42
Countryside	35*	27*	32	51	11	14	24	29

† Sample size 0–24. * Sample size 25–49. NA—Not applicable.

Table 6D. Use of program contraceptives and induced abortion since September 1976 among ever-married women 15-49 years of age who had never used them, by selected socioeconomic measures: Cheju and Hapchun (AFTER D)

	Percentage of use, by age group							
	15-29		30-39		40-49		Total	
Socioeconomic measure	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	48	33	47	55	16	15	37	32
Any in-laws still living?								
No	36*	†	41	60	14	11	25	26
Yes	49	32	50	53	19	20	42	37
Either parent still living?								
No	†	†	35	45	14	14	25	23
Yes	47	32	51	58	18	15	41	36
Interested in finding work?								
No	48	29	45	55	14	14	35	31
Yes	48	45*	50	55	18	16	39	36
Education								
None	†	†	†	58	14	12	21	23
Primary school	53	36	46	53	19	21	37	38
Middle school	46	33*	61	69	10*	†	46	39
High school	44	†	48*	†	†	†	43	40*
College or more	†	†	†	†	†	†	†	†
Residential background								
City	44	NA	47	NA	16	NA	37	†
Town	51	49*	52	67	16	15	39	30
Countryside	52*	28	43	52	17	15	34	32

† Sample size 0-24. * Sample size 25-49. NA—Not applicable.

Table 6E. Use of contraceptives since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected socioeconomic measures: Cheju and Hapchun (AFTER E)

Socioeconomic measure	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	37	37	51	77	16	26	36	47
Any in-laws still living?								
No	32*	†	48	84	11	21	26	42
Yes	38	36	52	74	22	30	40	50
Either parent still living?								
No	†	†	51	73*	14	24	28	37
Yes	37	36	51	78	18	27	39	51
Interested in finding work?								
No	39	34	49	76	14	25	34	45
Yes	35	49*	53	78	19	27	38	51
Education								
None	†	†	†	79	18	21	24	35
Primary school	36	40	48	74	16	34	34	53
Middle school	35	34	60	92*	†	†	43	55
High school	34	†	64*	†	†	†	43	64*
College or more	†	†	†	†	†	†	†	
Residential background								
City	37	NA	56	NA	22	NA	41	NA
Town	36	58*	49	88	13	22	34	57
Countryside	37*	31	45	74	14	26	32	45

† Sample size 0–24. * Sample size 25–49. NA—Not applicable.

Table 6F. Use of contraceptives and induced abortion since September 1976 among ever-married women 15–49 years of age who had never used or had stopped using them before September 1976, by selected socioeconomic measures: Cheju and Hapchun (AFTER F)

	Percentage of use, by age group							
	15–29		30–39		40–49		Total	
Socioeconomic measure	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun	Cheju	Hapchun
All women	53	39	63	78	24	26	48	48
Any in-laws still living?								
No	44*	†	58	84	18	22	35	43
Yes	54	38	64	76	30	32	53	52
Either parent still living?								
No	†	†	59	73*	20	24	37	38
Yes	52	37	64	79	27	29	52	52
Interested in finding work?								
No	52	35	57	77	20	26	44	46
Yes	54	51*	67	80	28	27	52	53
Education								
None	†	†	†	79	21	22	29	36
Primary school	58	40	60	76	27	35	49	54
Middle school	51	38*	73	92*	†	†	56	56
High school	48	†	71*	†	†	†	53	68*
College or more	†	†	†	†	†	†	†	†
Residential background								
City	50	NA	63	NA	28	NA	50	NA
Town	54	58*	65	88	22	22	49	47
Countryside	57*	33	60	76	22	28	45	46

† Sample size 0–24. * Sample size 25–49. NA—Not applicable.

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